FINAL SUBMITTAL

ENERGY ENGINEERING ANALYSIS PROGRAM (EEAP)

LIMITED ENERGY STUDY

WATERVLIET ARSENAL

WATERVLIET, NEW YORK

VOLUME IIIa

SITE SURVEY FORMS--ANCILLARY FACILITIES

CONTRACT NO. DACA65-91-C-0072

PREPARED FOR:

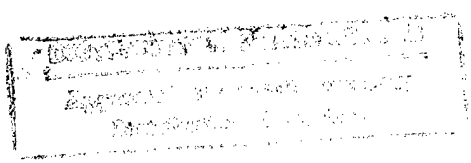
U.S. ARMY CORPS OF ENGINEERS
NORFOLK, VIRGINIA

PREPARED BY:

ENERGY AND ENVIRONMENTAL SERVICES DEPARTMENT
REYNOLDS, SMITH AND HILLS, INC.
P.O. BOX 4850
JACKSONVILLE, FLORIDA 32201

RS&H PROJECT NO. 2900379002

APRIL 1992



DEPARTMENT OF THE ARMY
CONSTRUCTION ENGINEERING RESEARCH LABORATORIES, CORPS OF ENGINEERS
P.O. BOX 9005
CHAMPAIGN, ILLINOIS 61826-9005

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Marie Wakefield,
Librarian Engineering

VOLUME III-a

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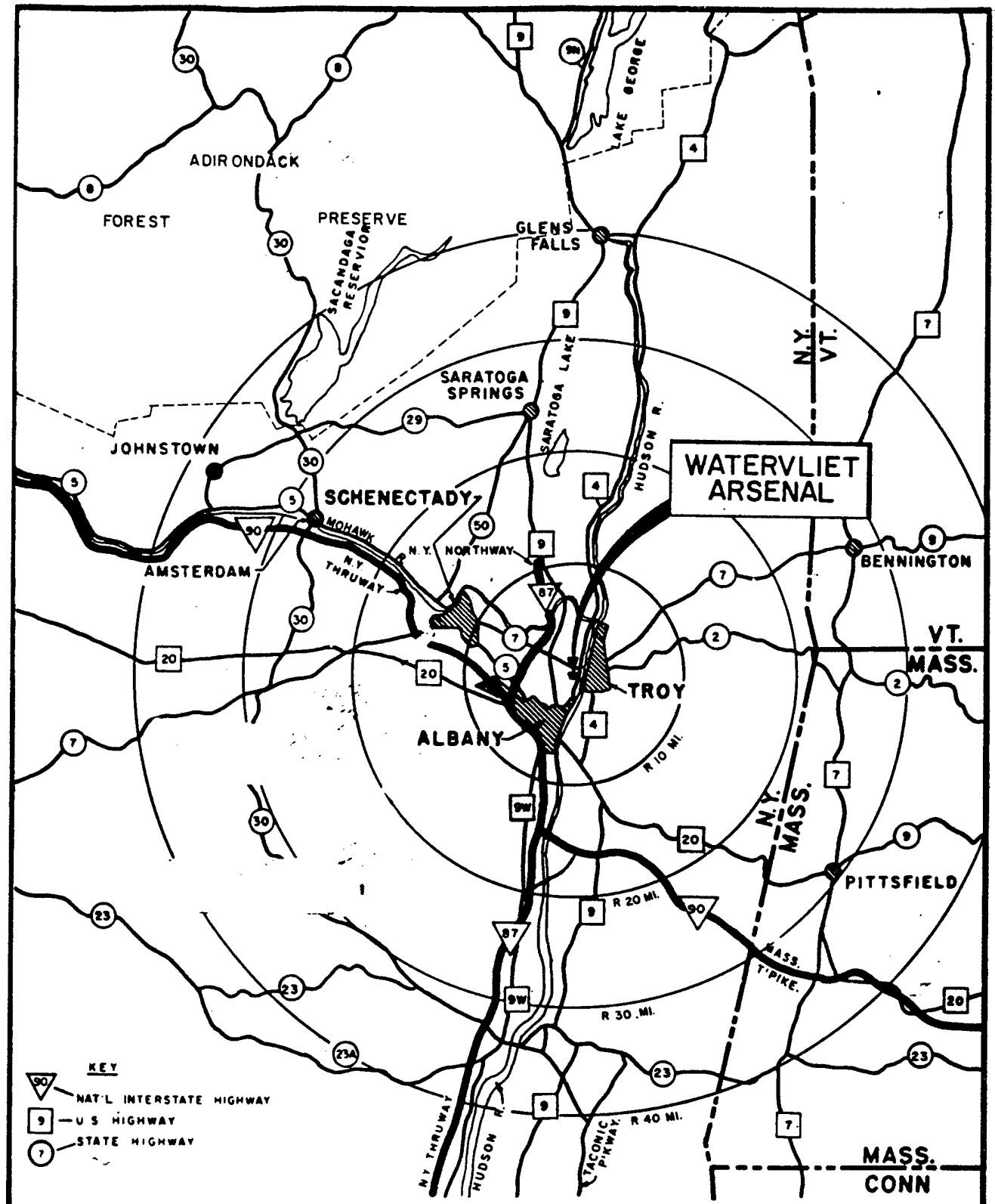
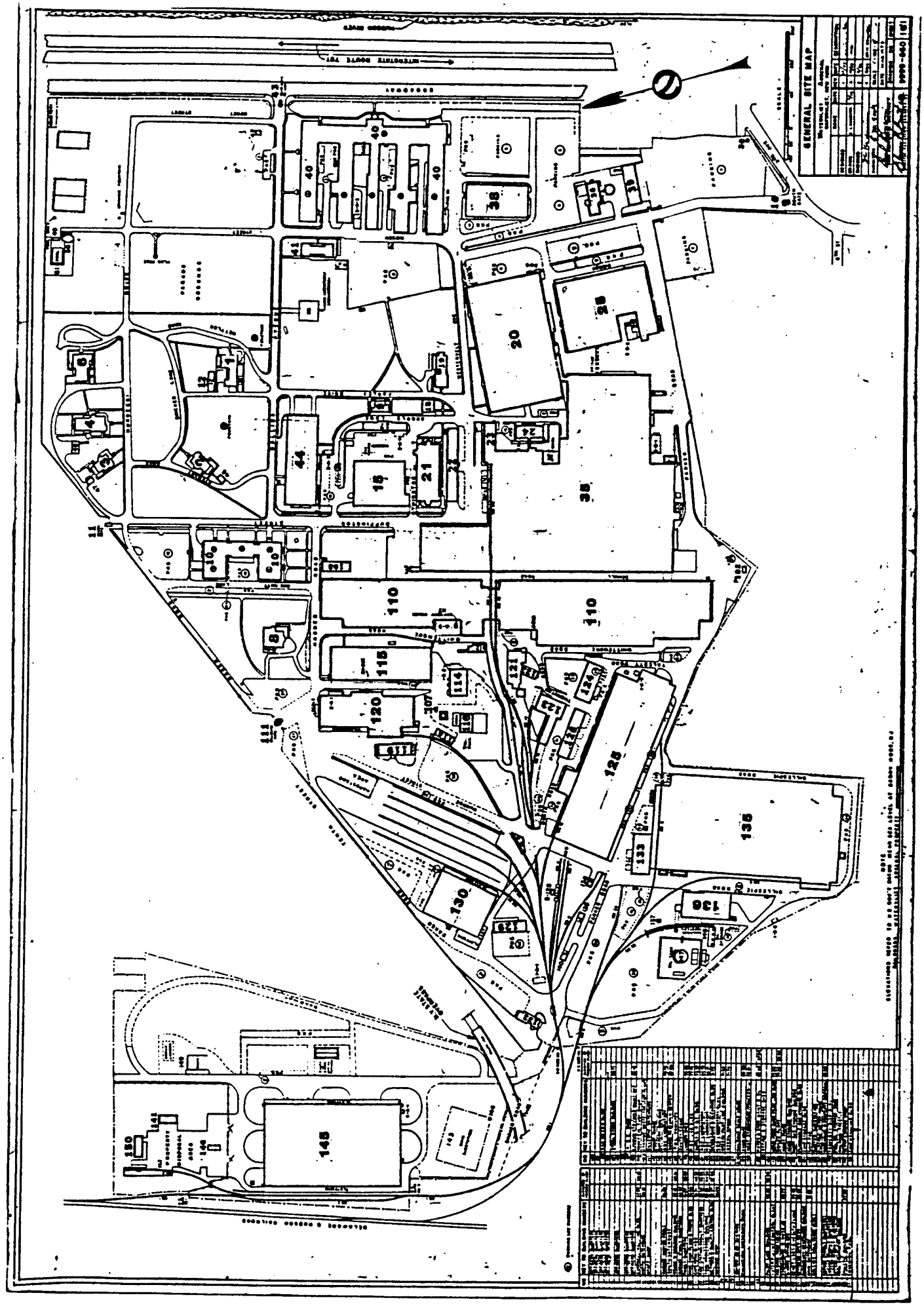


VICINITY MAP


GENERAL SITE MAP
40
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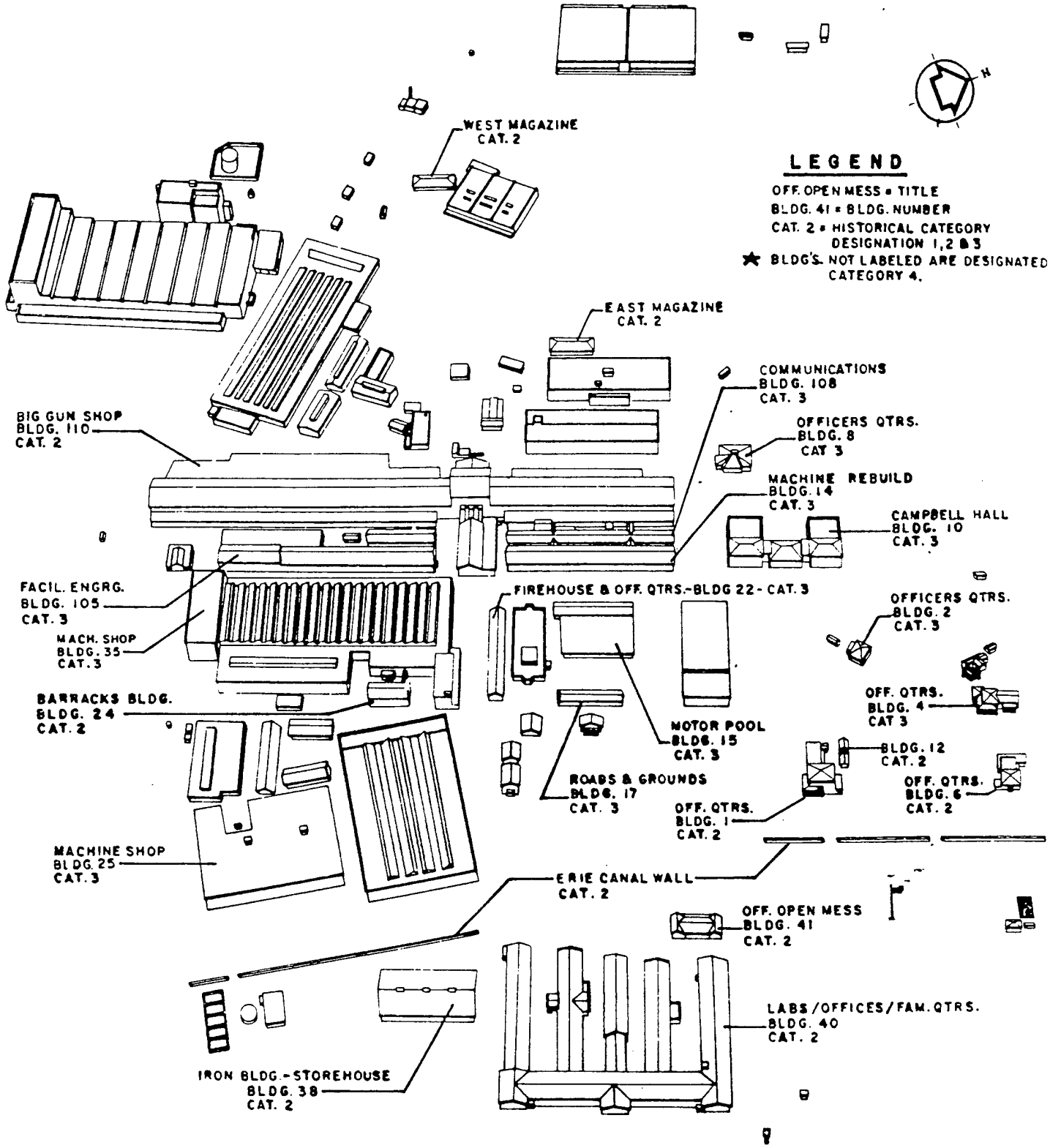


HISTORICAL BLDGS. LOCATION MAP

BUILDINGS TO BE AUDITED AND GENERAL ECOs

BASIC INDUSTRIAL FACILITIES

OPTION 1 - ANCILLARY FACILITIES

Number	Number	Description
1	10	Campbell Hall
2	15	Garage (Motor Pool)
3	20	Major Component Building
4	21	O'Keefe Hall
5	22	Fire Station
6	23	Operations Office
7	24	Operations Office
8	25	Minor Comp. Bldg. & Op. Offices
9	38	Storehouse and Museum
10	40	Benet Labs & Others
11	44	Dalliba Hall/Product Assurance
12	110	(Remainder) Heavy Caliber Tube Bldg.
13	115	Maggs Research Center
14	120	Facilities Offices and Shops
15	130	Storehouse/Processing Building
16	136	Boiler Plant
17	145	Warehouse & Property Disposal

GENERAL ECOS

a. Steam distribution and condensate return systems
b. Building ventilation and exhaust systems
c. Radiant heating
d. Space heating controls
e. Energy-efficient lighting
f. Energy-efficient ballasts
g. Lighting controls
(Including occupancy sensors, photocells, separate switching)
h. Fluorescent fixture reflectors

SMCWV-EHE

31 July 1991

BUILDING ENERGY MONITORS
REVISED LIST

BLDG/AREA	WARDEN	EXTENSION	RESPONSIBLE DIRECORATE
10 (1st flr)	Barbara Carpentar	4258	Resource Management (RM)
10 (2nd, 3rd flr)	Walter Libudziewski	4778	Procurement (PPI-P)
15	Art Tonjes	5858	Logistics (LDT)
20	Ron Berben - 1st shift	5547	Operations (ODM-H)
	Edward Facteau - 2nd shift	5655	Operations (ODM-H)
	John Adamo - 3rd shift	5655	Operations (ODM-H)
21	Ed Van Kampen	5473	Community Activities (PCC)
22	Don Strait	5990	Engineering & Housing (EHF)
24	Don Marcello	5313	Operations (OD)
25 (3rd flr)	Timpy Uppal	5257	Operations (ODP-IO)
25 (2nd flr)	Ted Pollak - 1st shift	5994	Operations (ODM-M)
25 (1st flr)	Steve Albright - 1st shift	5489	Operations (ODM-M)
25 (1st flr)	Rich Trembley - 2nd shift	5489	Operations (ODM-M)
25 (1st flr)	Jerry Gavin - 3rd shift	5775	Operations (ODM-M)
35 Bay A	Robert Rawls	5145	Operations (ODM-C)
Bays B-D	Michael Caulfield - 1st shift	5840	Operations (ODM-C)
	Robert Michaels - 2nd shift	5265	Operations (ODM-C)
	Bart Bisgrove - 3rd shift	5162	Operations (ODM-H)
Bays E-J	Donald Anselment - 1st shift	5089	Operations (ODM-H)
	Gregory Temblador - 2nd shift	5089	Operations (ODM-H)
	James Fox - 3rd shift	5089	Operations (ODM-H)
35 East	Charlie Morris - 1st shift	5978	Operations (ODM-F)
	John Bailey - 2nd shift	5179	Operations (ODM-F)
	Charlie O'Brien - 3rd shift	5179	Operations (ODM-F)
40 (1st flr)	Gary Conlon	5543	Benet Laboratory (CCB-S)
40 (2nd flr)	Larry Marten	4701	Benet Laboratory (CCB-D)
44	William O'Hara, Jr.	5742	Product Assurance (QA)
110 Bays A-E, 60-69	Edward Maruszcak	5266	Operations (ODM-C)
Bays D-E, 13-20	Paul Seney	5383	Benet Laboratory (CCB-SE)
All Other Bays	Michael Caulfield	5840	Operations (ODM-C)
115	John Wrzochalski	4970	Benet Laoratory (CCB-R)
120	Jack Collins	5934	Engineering and Housing (EHW)
123	David Malcolm	5389	Operations (ODS-P)
125	Jerry Gariepy - 1st shift	5049	Operations (ODM-T)
	Robert Buck, 2nd shift	5084	Operations (ODM-T)
126	Jim Lohaus	5683	Operations (ODS-SW)
135	Robert Abeel - 1st shift	4271	Operations (ODM-C)
	John McElwee - 2nd shift	4271	Operations (ODM-C)
	Bart Bisgro - 3rd shift	5162	Operations (ODM-C)
145	Theresa Milo	4112	Defense Reutilization & Marketing Office (DRMO-XPP)

NOTE: For all other buildings, contact your Directorate Office.

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: _____ Bldg. # 120 DATE: 10/15/91

Notes & Comments: Lubricating

Russ Wells - DEH

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: _____ Bldg. # _____ DATE: 10/18/91

Notes & Comments:

Exit Briefing

Major Nally

- Lighting
- Heating
- EMCS - integrate with L+H

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: _____ Bldg. # 108 DATE: 10/17/91

Notes & Comments: J. Garrett

Ethernet System 802.3 - Industry Standard

- Have cable to all buildings
- Factory floor - DECNET
- Admin - TCP/IP

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: P. Hutchins Bldg. # 120 DATE: 10/18/91

Notes & Comments:

Dennie Brooks Phil Dorsey x4534

Existing system controls valves - slow on/off

Bldg #10 hot water with setback

#40 "

DHW Steam #25 only one

- No list of water heaters
- List of chillers

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY:_____ Bldg. # _____ DATE:_____

Notes & Comments:

Dan Brooks

10 - A/C and heat

15 -

@ Lan System Ethernet Jim Garret
Honeywell has system
Lan system exists - can we add on
to control energy with this

2100 Steam traps TrapMan
≈ 12% fail each year

A/C 10, 15, 20, 24, 25, 40, 44, 110 (telephone room)
112, 115, 120

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # ALL DATE: 10-15-91

Notes & Comments:

All pressure measurements were taken with:

Airdata™ Multimeter
Electronic Micromanometer
Model No. CFM-86
Manufactured by Shortridge Instruments, Inc.
Owned by Watervliet Arsenal Maintenance

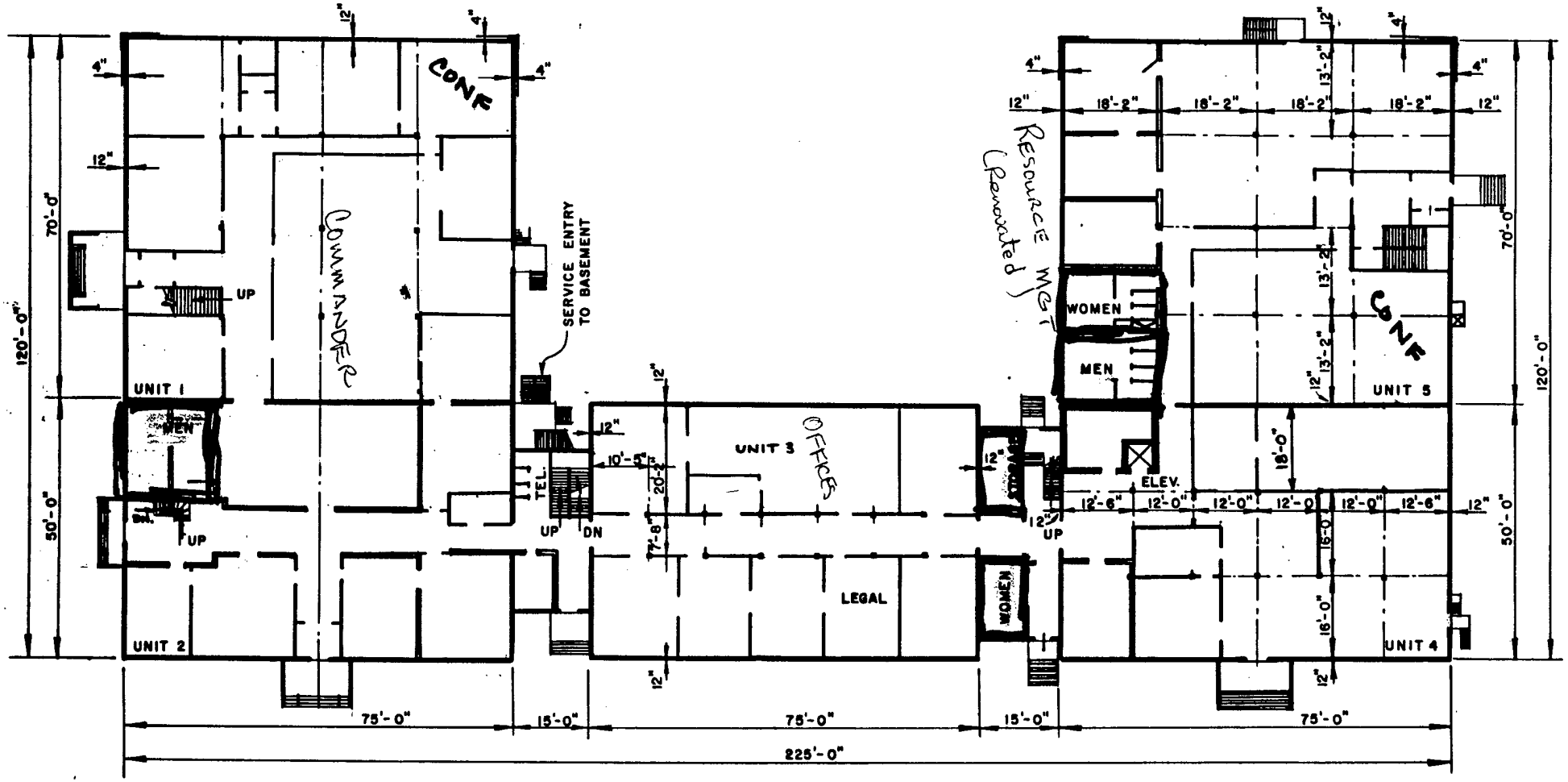
Shortridge Instruments, Inc.
7855 East Redfield Road
Scottsdale, AZ 35260
Phone # 602-991-6744
FAX # 602-443-1267

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
ARSENAL TOTALS (1)				9,377	20,014		1,490,955		6,673,506	

SQ. FT. = 1,002,119
WATTS/SQ. FT. = 1.5

(1) Includes HIV lamps in Bldg 25



13

NET FLOOR AREA
24,495
Square feet

FLOOR CAPACITY

N

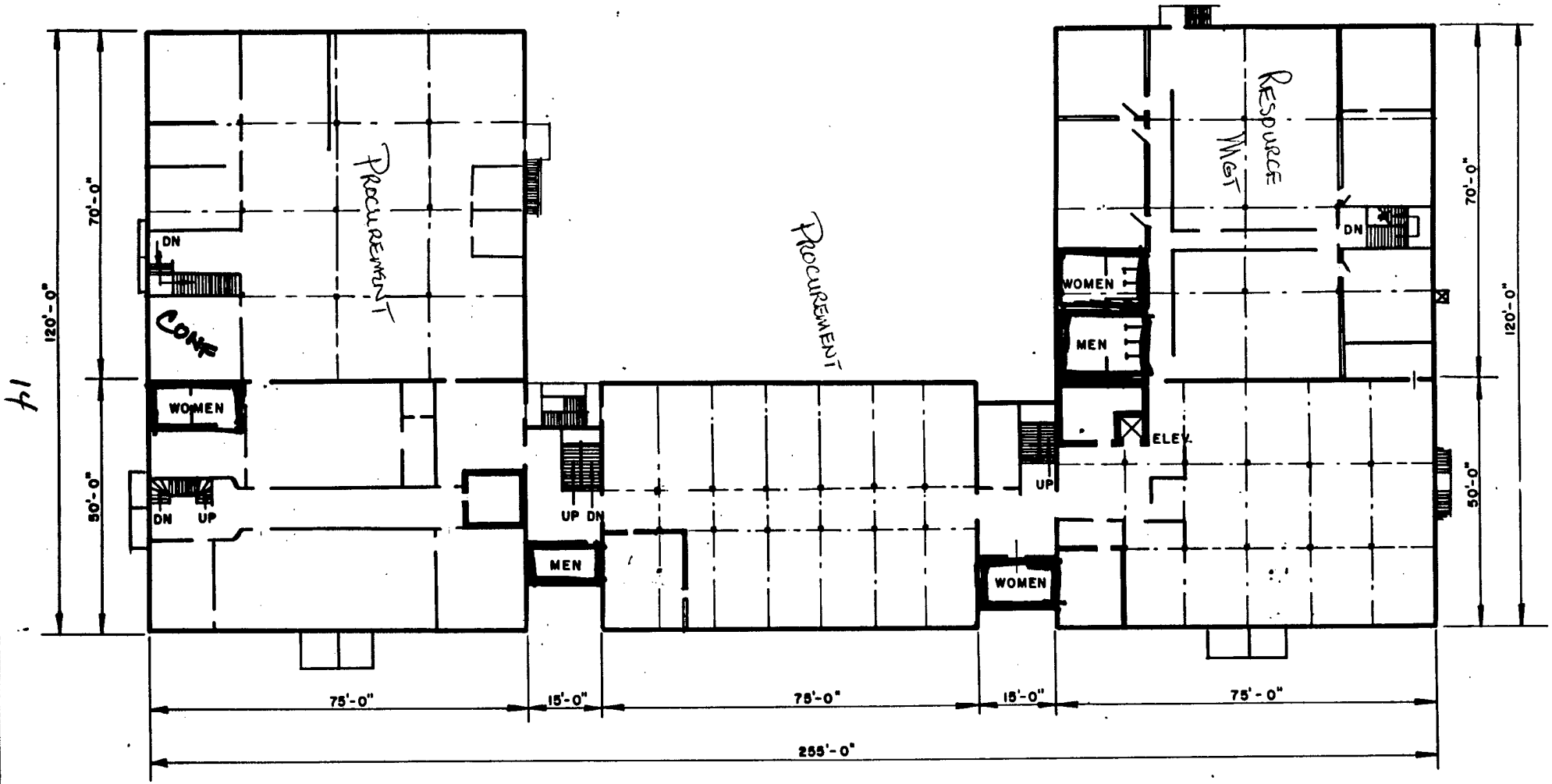
WATERVLIET ARSENAL

WAT[illegible]ET, N.Y.

Drawn by: J.R.GANGEMI, A[illegible] by: [illegible]

FIRST FLOOR PLAN
CAMPBELL HALL
BUILDING NO. 10

Revisions	Date
72	4/76



NET FLOOR AREA
21,495
Square feet

FLOOR CAPACITY
SQ + CTR 50 LBS N 40 LBS

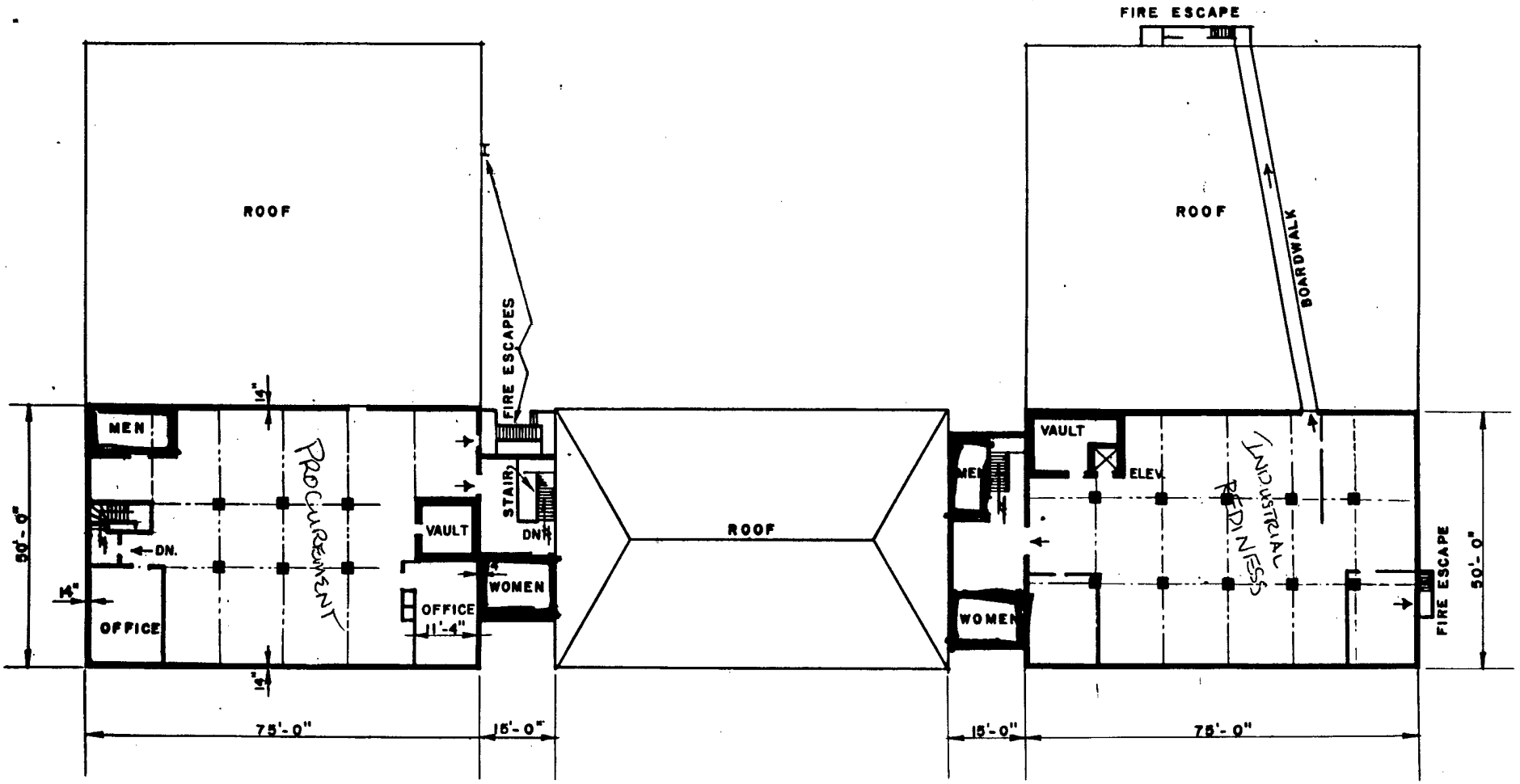
WATERVLIET ARSENAL

WAT ET, N.Y.

Drawn by: J.R.GANGEMI, [redacted] by: K. Kaufmann

SECOND FLOOR PLAN
CAMPBELL HALL
BUILDING NO 10

Revisions	Date
	4/76



15

NET FLOOR AREA
8,025 Square feet
FLOOR CAPACITY: 30 LBS Per square foot

N

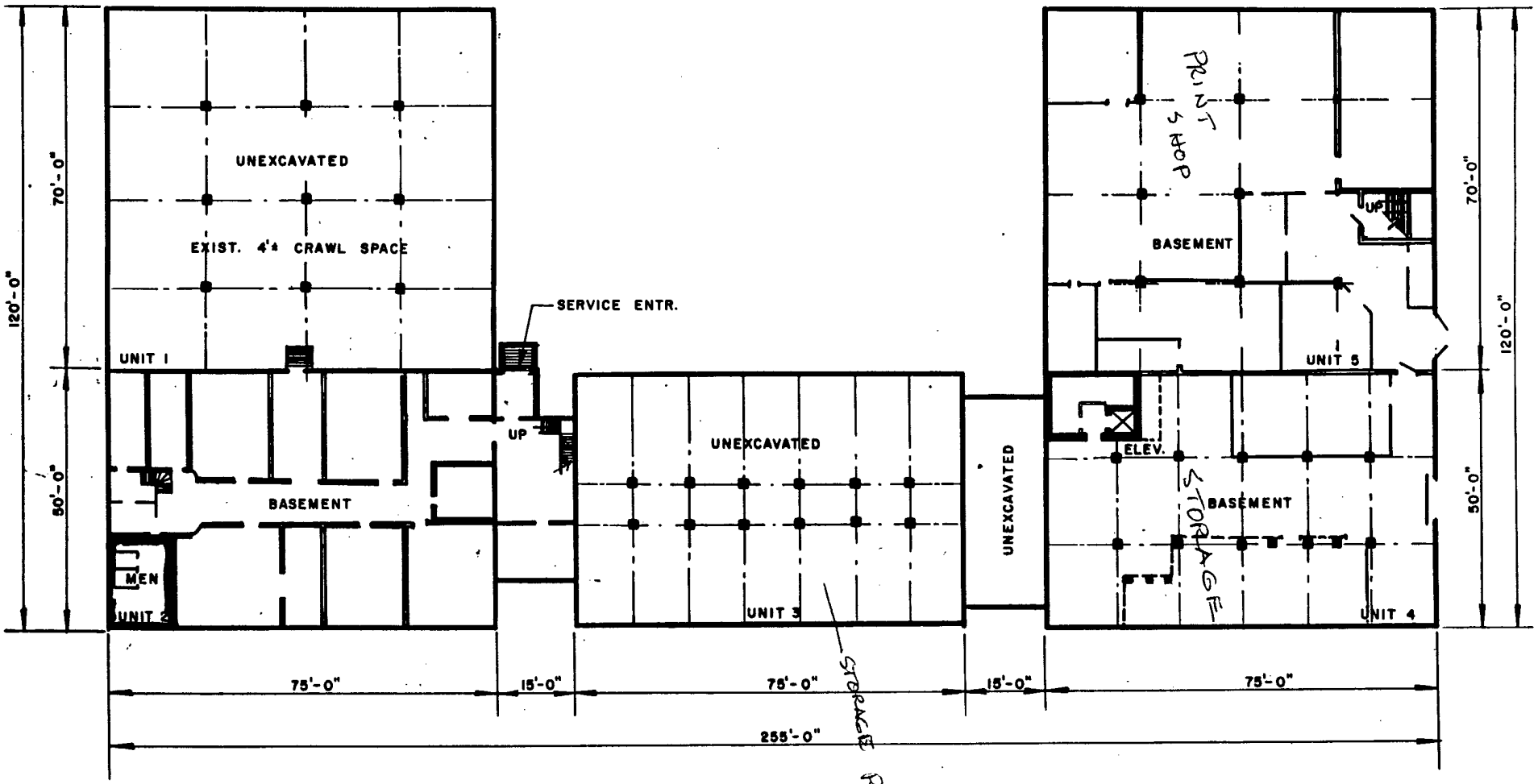
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R. GANGEMI, [illegible] by: [illegible]

THIRD FLOOR [illegible]
CAMPBELL HALL
BUILDING NO. 10

Revisions	Date
TR	4/76



NET FLOOR AREA
11,855
Square feet

FLOOR CAPACITY

WATERVLIET ARSENAL

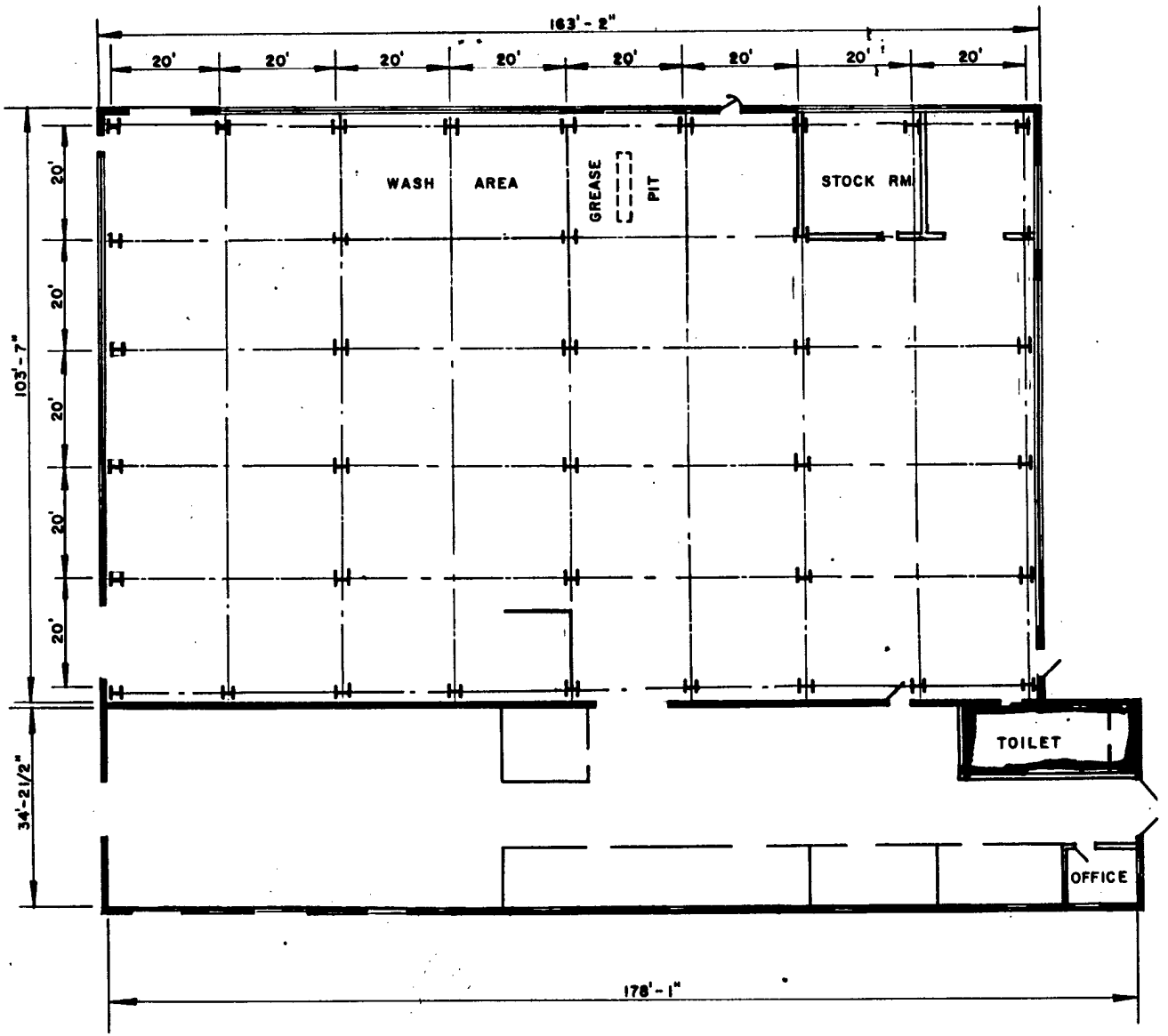
WATERVLIET, N.Y.

Drawn by: J.R. [illegible] A.E. App'd by: [signature]

Revisions

R

BASEMENT PLAN
CAMPBELL HALL
BUILDING NO. 10



L1

NET FLOOR AREA
22,865
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

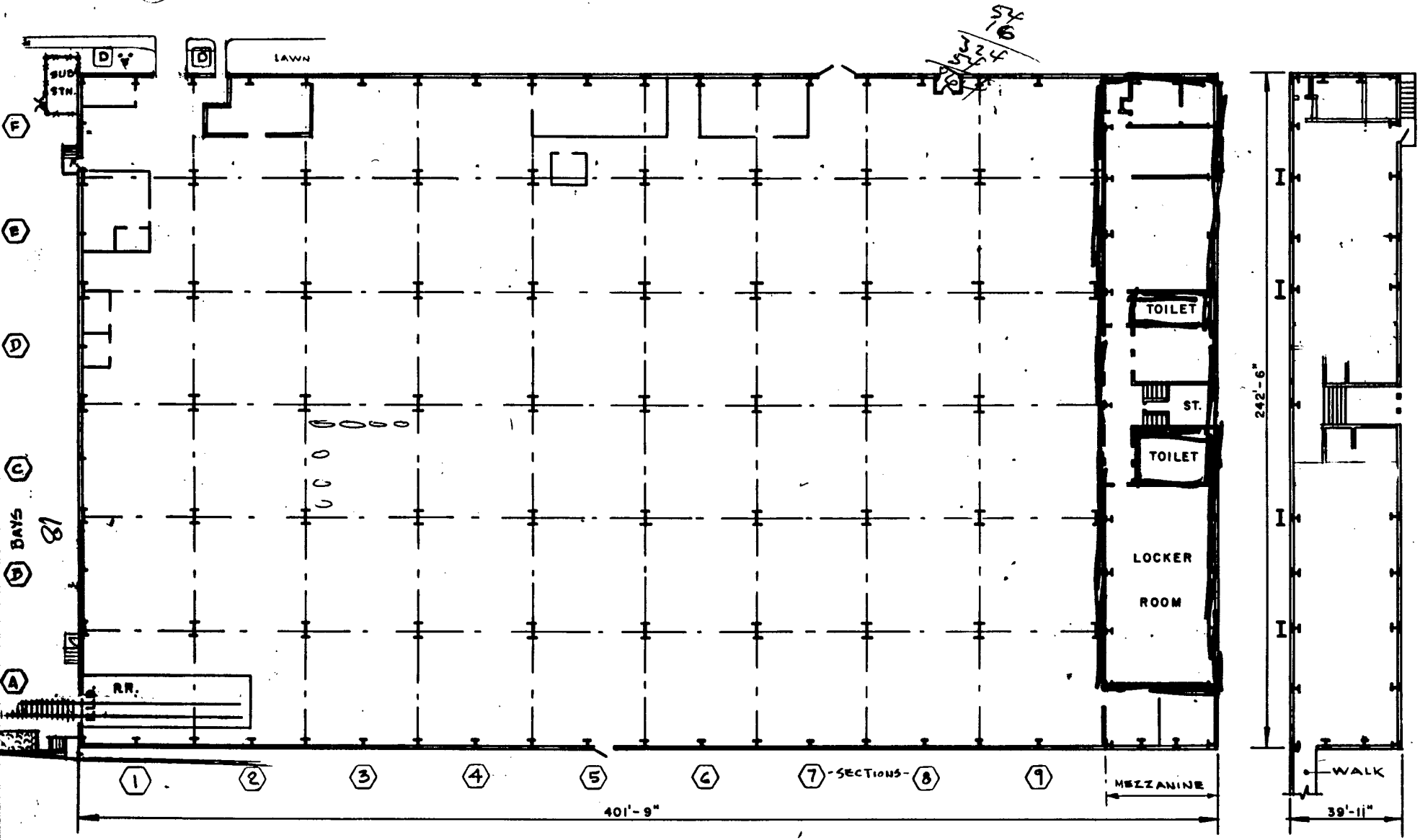
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R. GANGEMI, A.E. [illegible] by:

Revisions	Date

FLOOR PLA[illegible]
GARAGE (MOTOR [illegible]
BUILDING NO. 15

Scale: 1" = 30'-0" Date



FIRST FLOOR

MEZZANINE

NET FLOOR AREA
108290
Square feet

FLOOR CAPACITY
1000 LBS - 100 LBS
Per square foot

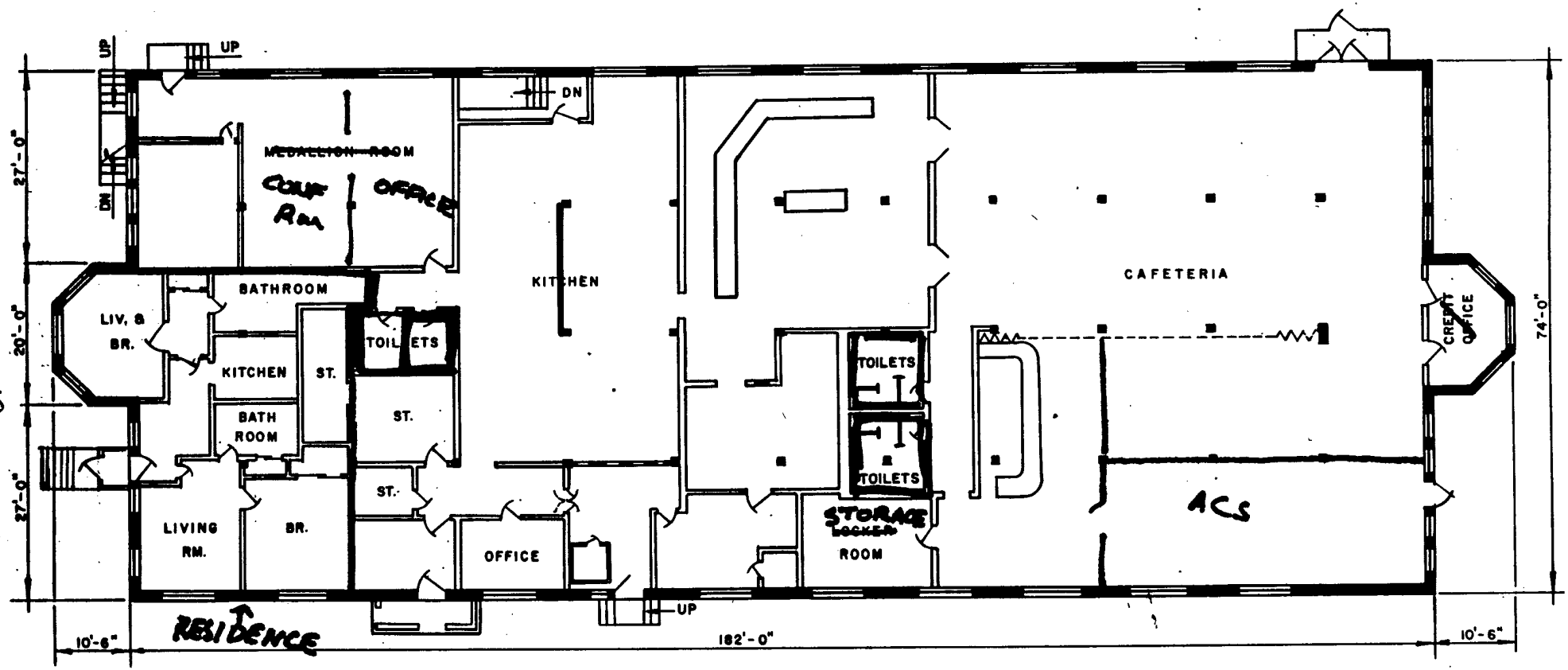
N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A. [redacted] by: [redacted]

FIRST FLOOR
MEZZANINE
BUILDING NO. 20

Revisions	Date



61

47
30
1410

14990
- 1410
13,580

NET FLOOR AREA
14,990
Square feet

FLOOR CAPACITY

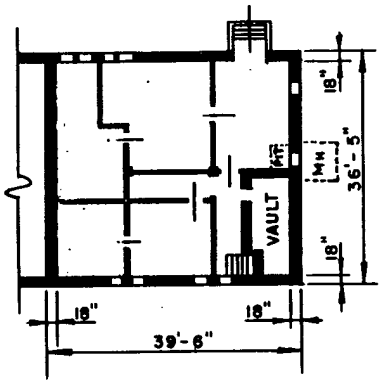
N

WATERVLIET ARSENAL
WATERVLIET, N.Y.
Drawn by: J.R.GANGEMI 'd by:

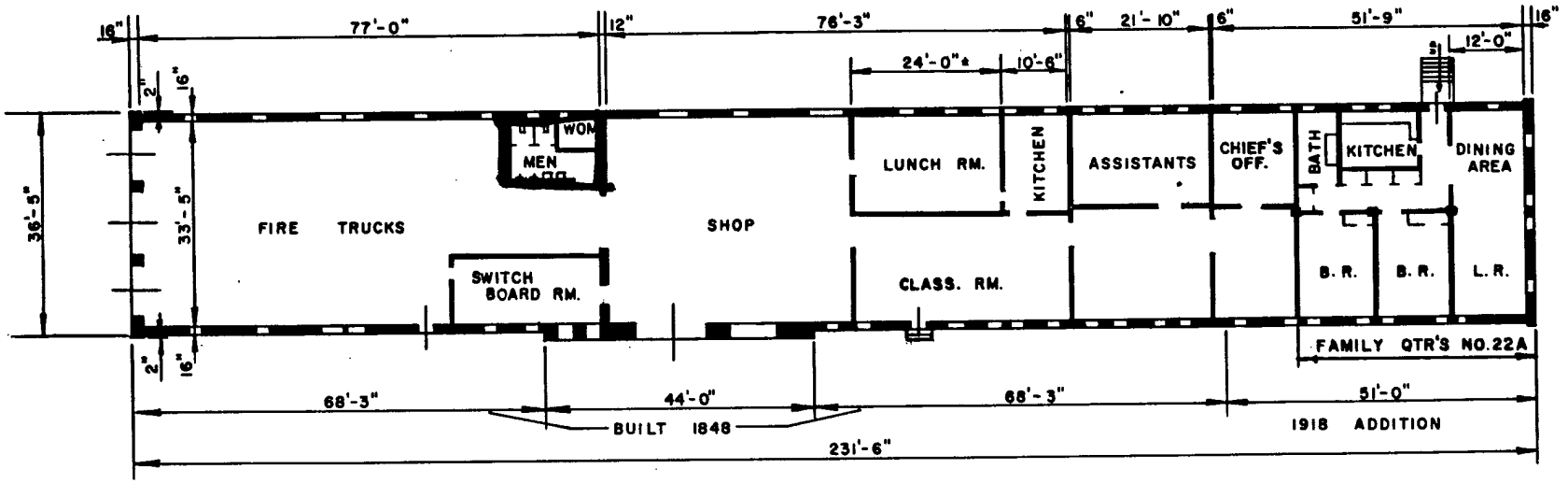
MAIN FLOOR PLAN
CAFETERIA & VISITING
OFFICERS QUARTERS

Revisions	Date
	3/72

7'-0" CLG. HT.



BASEMENT



FIRST FLOOR

20

NET FLOOR AREA
18,959
Square feet

FLOOR CAPACITY

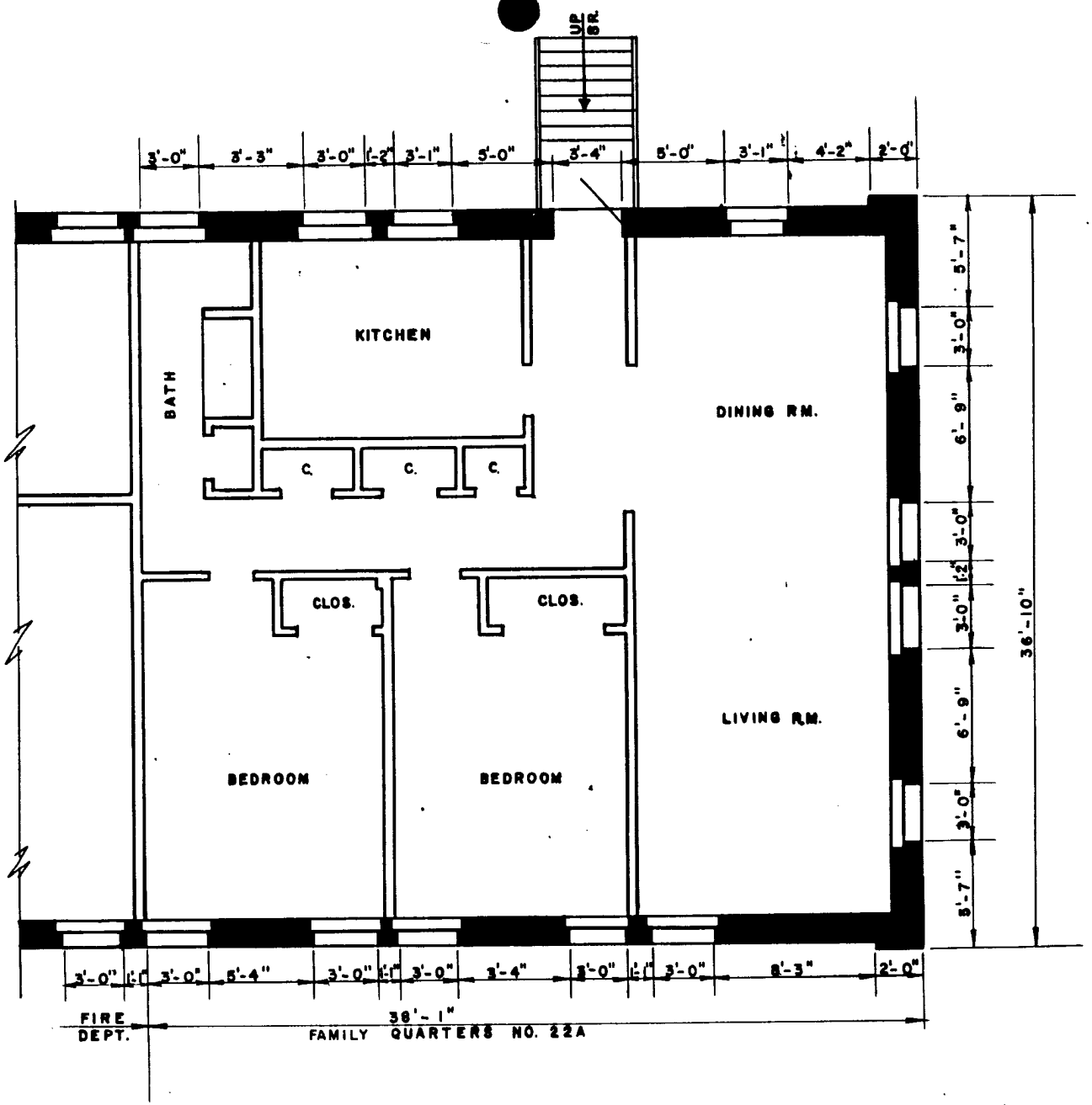
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEM[illegible] Approved by: [signature]

Revisions	Date

1ST. FL. & BASEMENT PLANS
FIRE STATION



21

NET FLOOR AREA
1,214
Square feet.

FLOOR CAPACITY.

Per square foot.

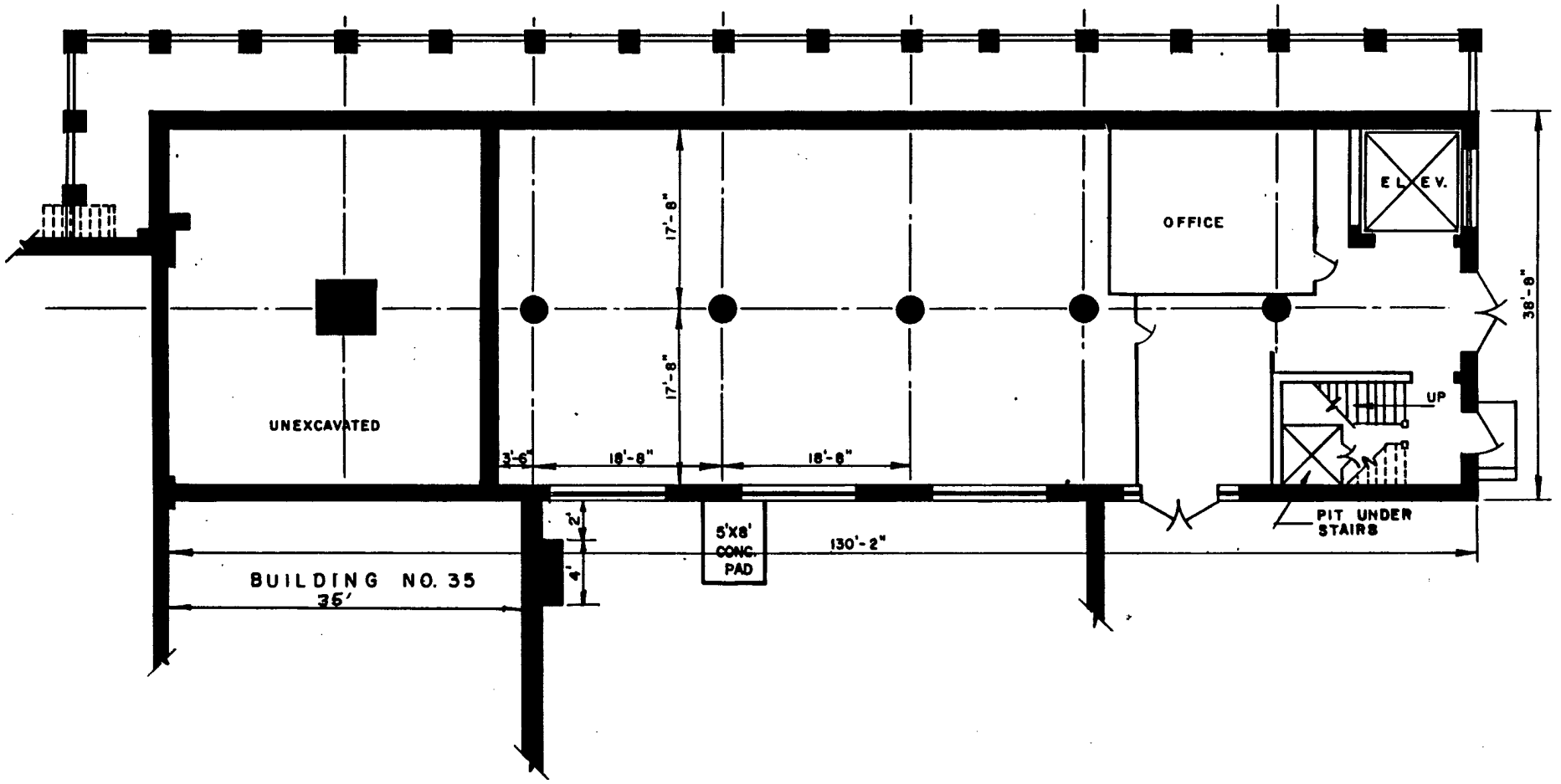
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R GANGEMI, A.E. Approved by:

Revisions	Date

FIRST FLOOR PLAN
FIRE STATION
BUILDING NO. 22

Scale: 1/8"=1'-0" Date:



22

NET FLOOR AREA
3,370
Square feet

FLOOR CAPACITY

N

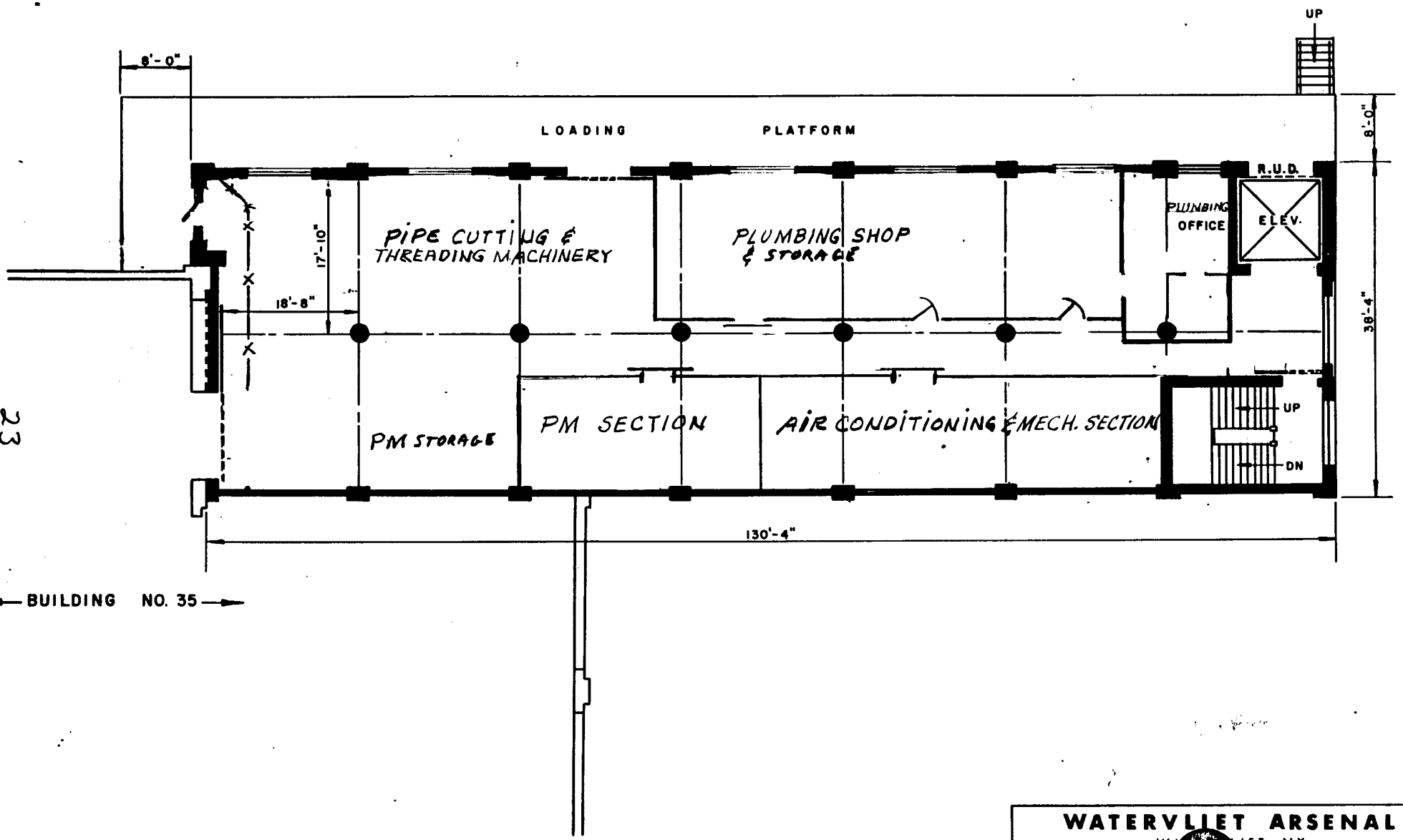
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, [illegible] by:

BASEMENT FLOOR OF
TOOL PROCESSING
BUILDING

Revisions	Date



23

NET FLOOR AREA
9,410
Square feet

FLOOR CAPACITY

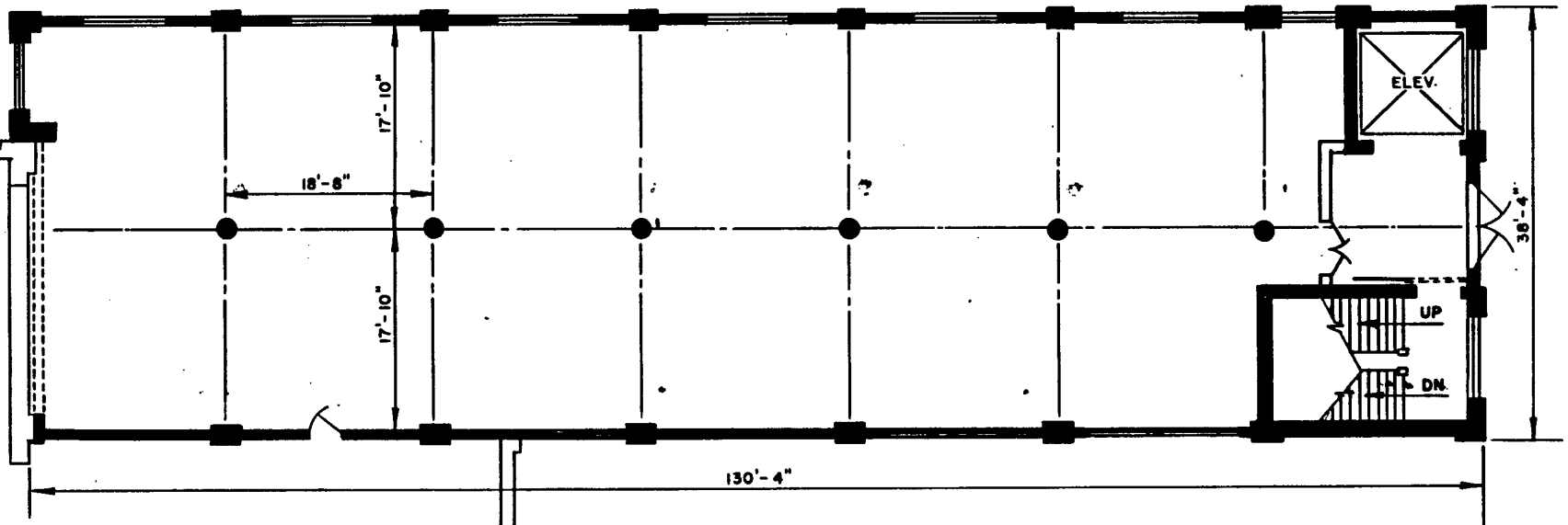
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI Approved by:

FIRST FLOOR PLAN
TOOL PROCESSING
BUILDING

Revisions	Date



BUILDING NO. 35

NET FLOOR AREA
8,410
Square feet

FLOOR CAPACITY

N

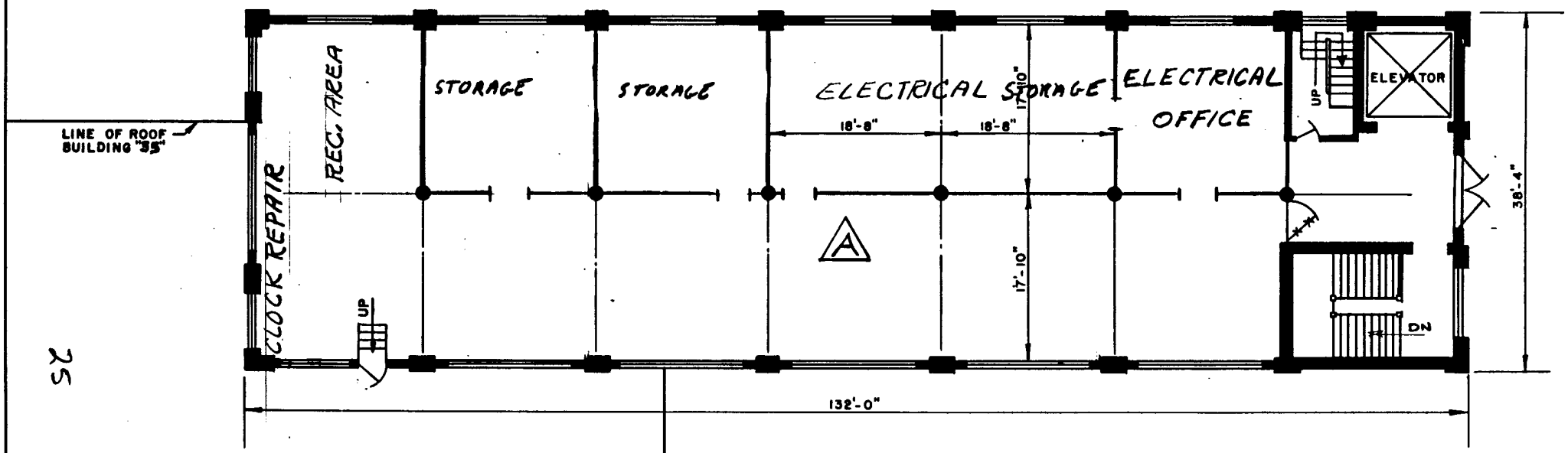
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A[illegible] by: [illegible]

SECOND FLOOR [illegible]
TOOL PROCESSING
BUILDING

Revisions	Date



BUILDING NO. 35

LINE OF ROOF BUILDING "35"

NET FLOOR AREA
5,410
Square feet

FLOOR CAPACITY

N

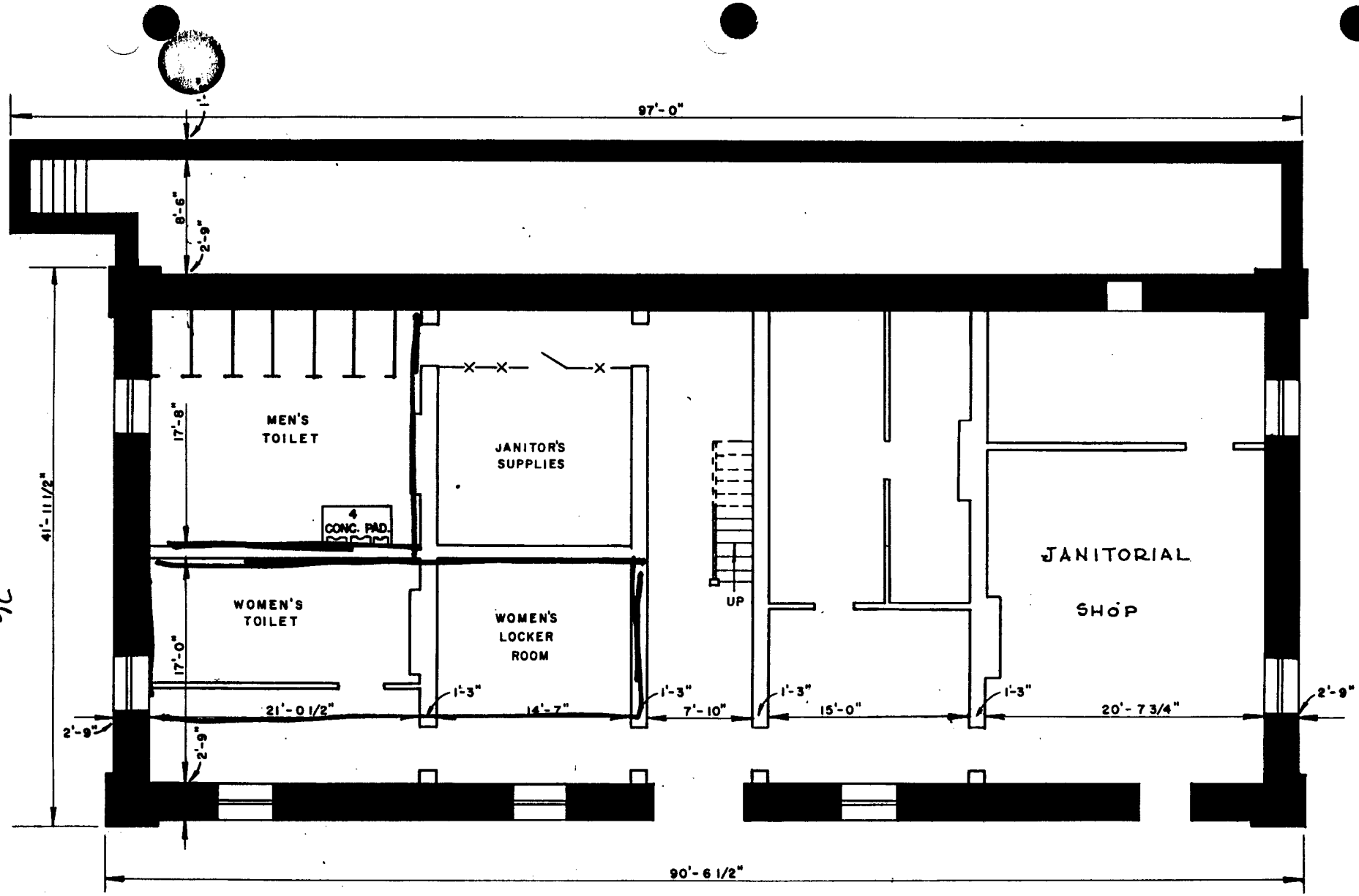
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI Checked by:

THIRD FLOOR PLAN
TOOL PROCESSING
BUILDING NO. 23

Revisions	Date
A GENERAL	9-78 T.F.N



NET FLOOR AREA
4,212
Square feet

FLOOR CAPACITY
1,000 LBS
Per square foot

N

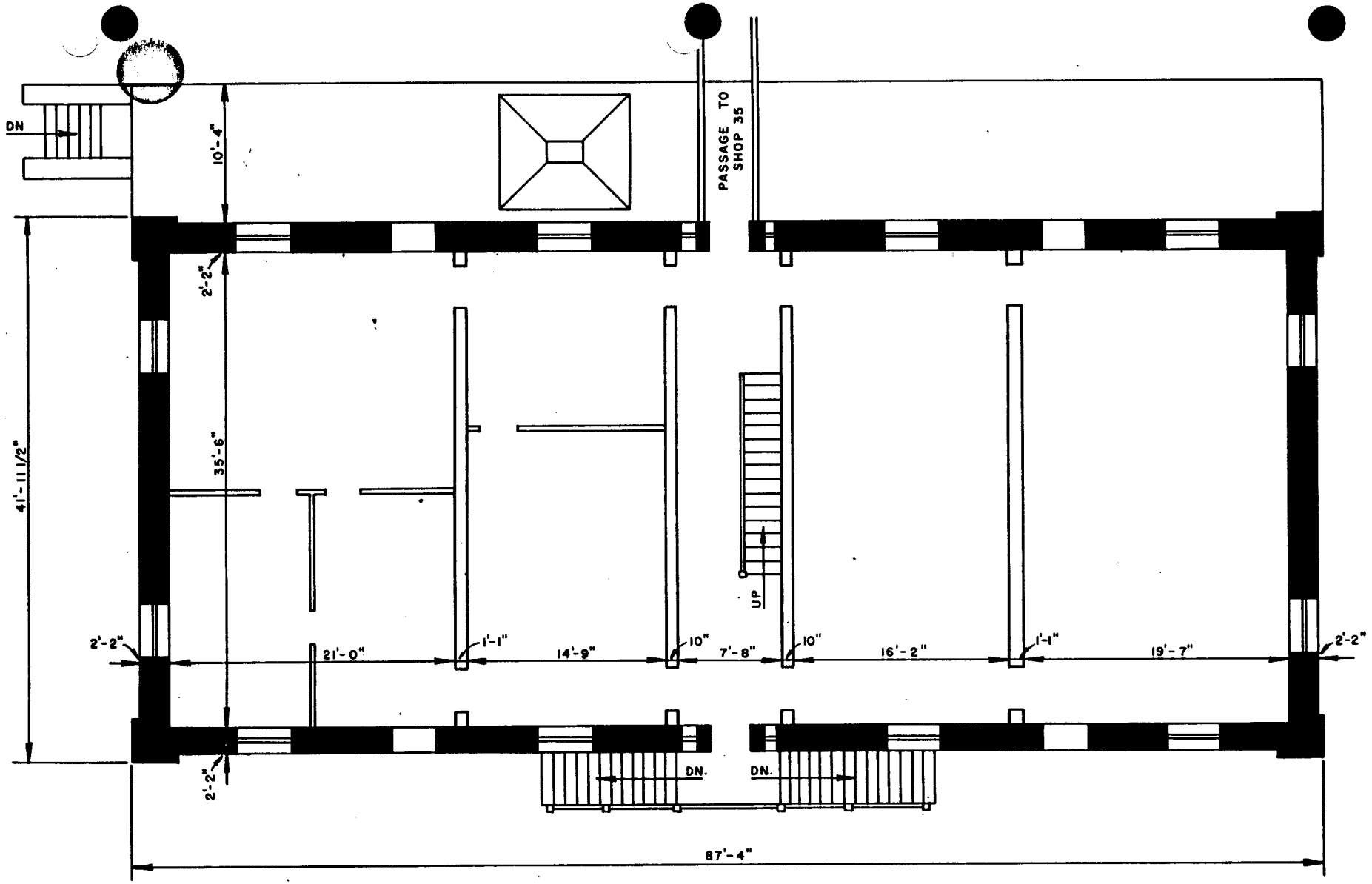
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

BASEMENT FLOOR PLAN
METHODS & QUALITY
CONTROL BUILDING
BUILDING NO. 24

Scale: 3/32"=1'-0" Date:

Revisions	Date



27

NET FLOOR AREA
4,434
Square feet

FLOOR CAPACITY
Per square foot

N

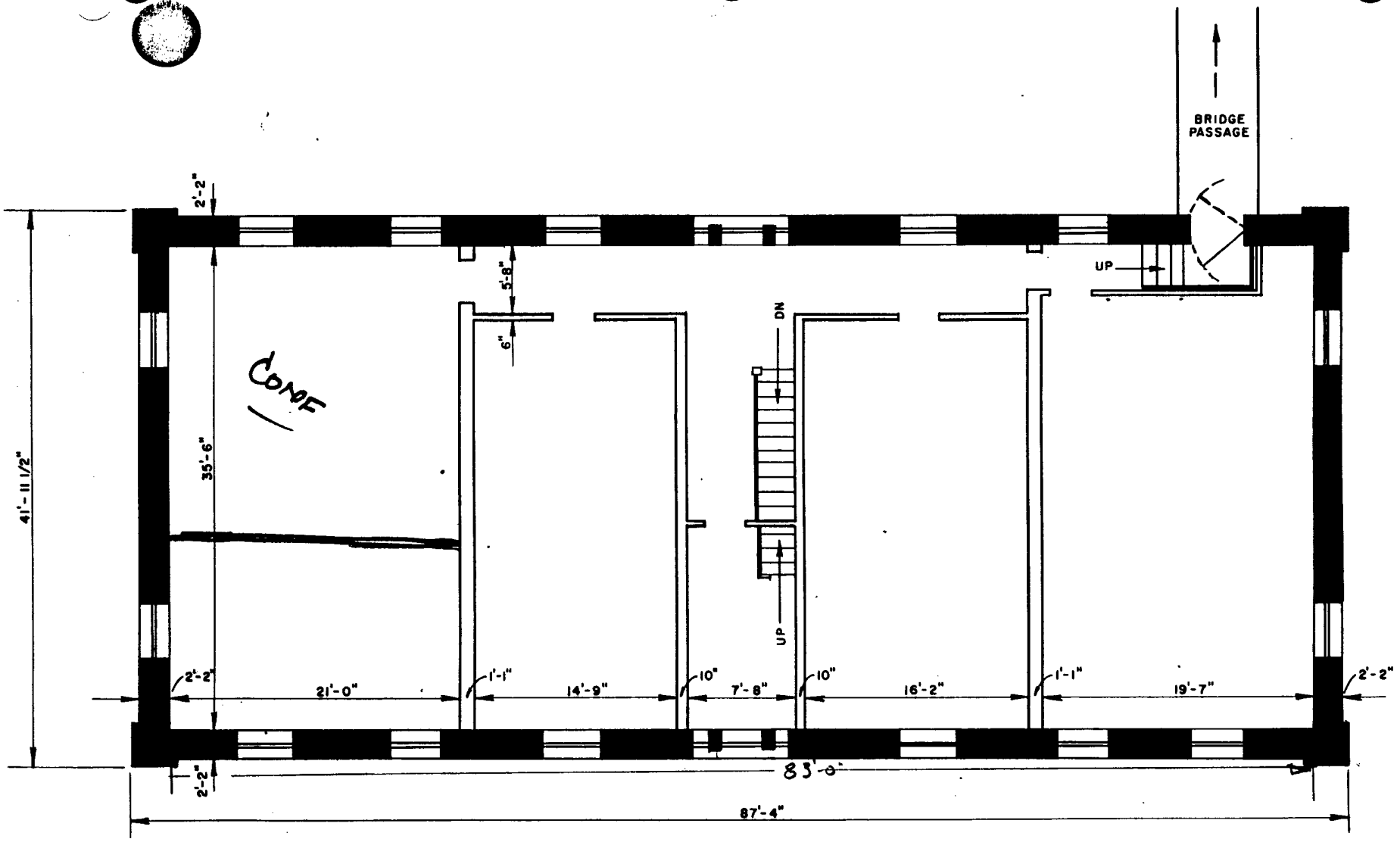
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

FIRST FLOOR PLAN
METHODS & QUALITY
CONTROL BUILDING
BUILDING NO. 24

Scale: 3/32"=1'-0" Date:

Revisions	Date



28

NET FLOOR AREA
4,434
Square feet

FLOOR CAPACITY

Per square foot

N

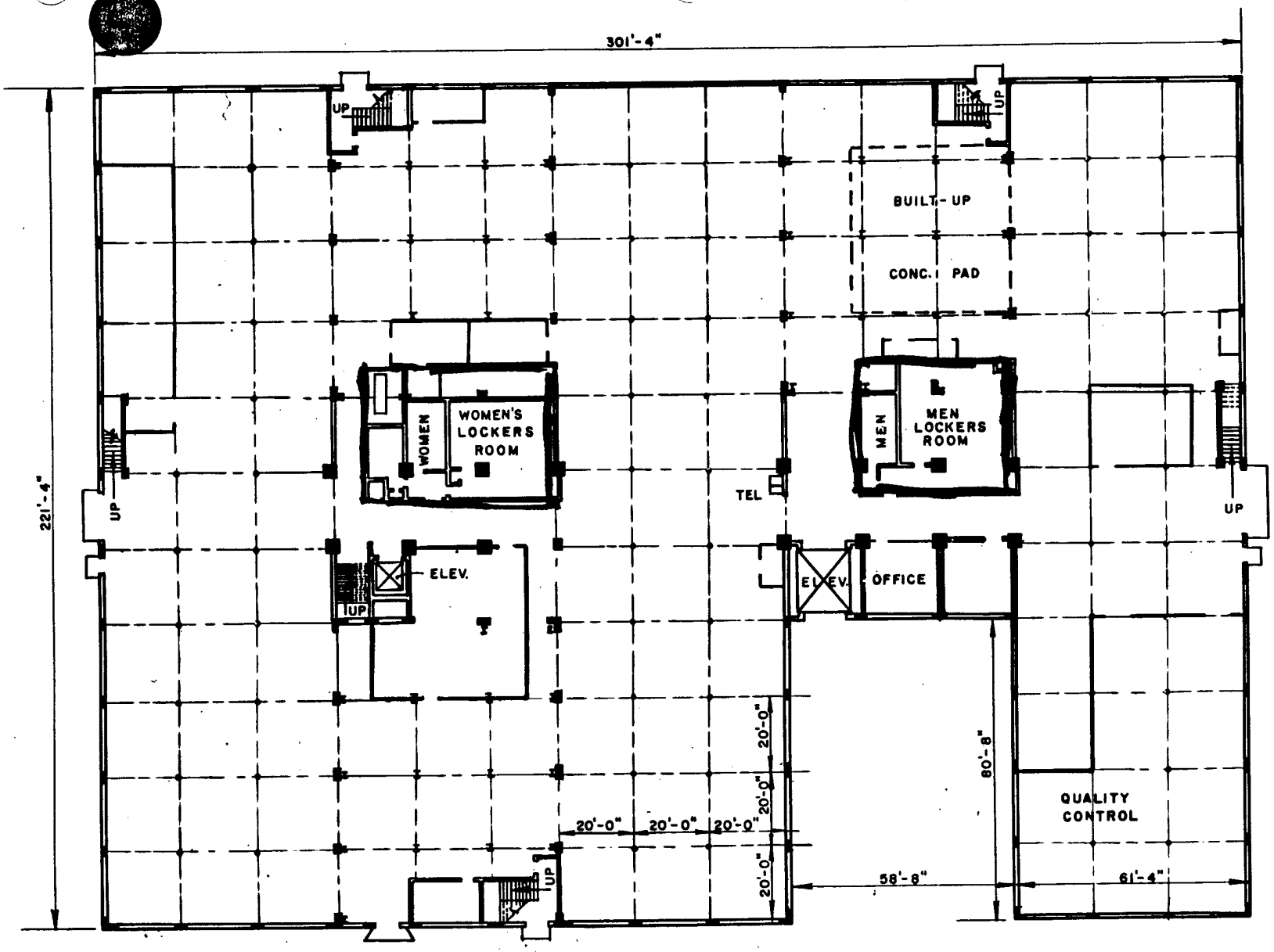
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR PLAN
METHODS & QUALITY
CONTROL BUILDING
BUILDING NO. 24

Scale: 3/32"=1'-0" Date:

Revisions	Date



29

NET FLOOR AREA
60,850
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

N

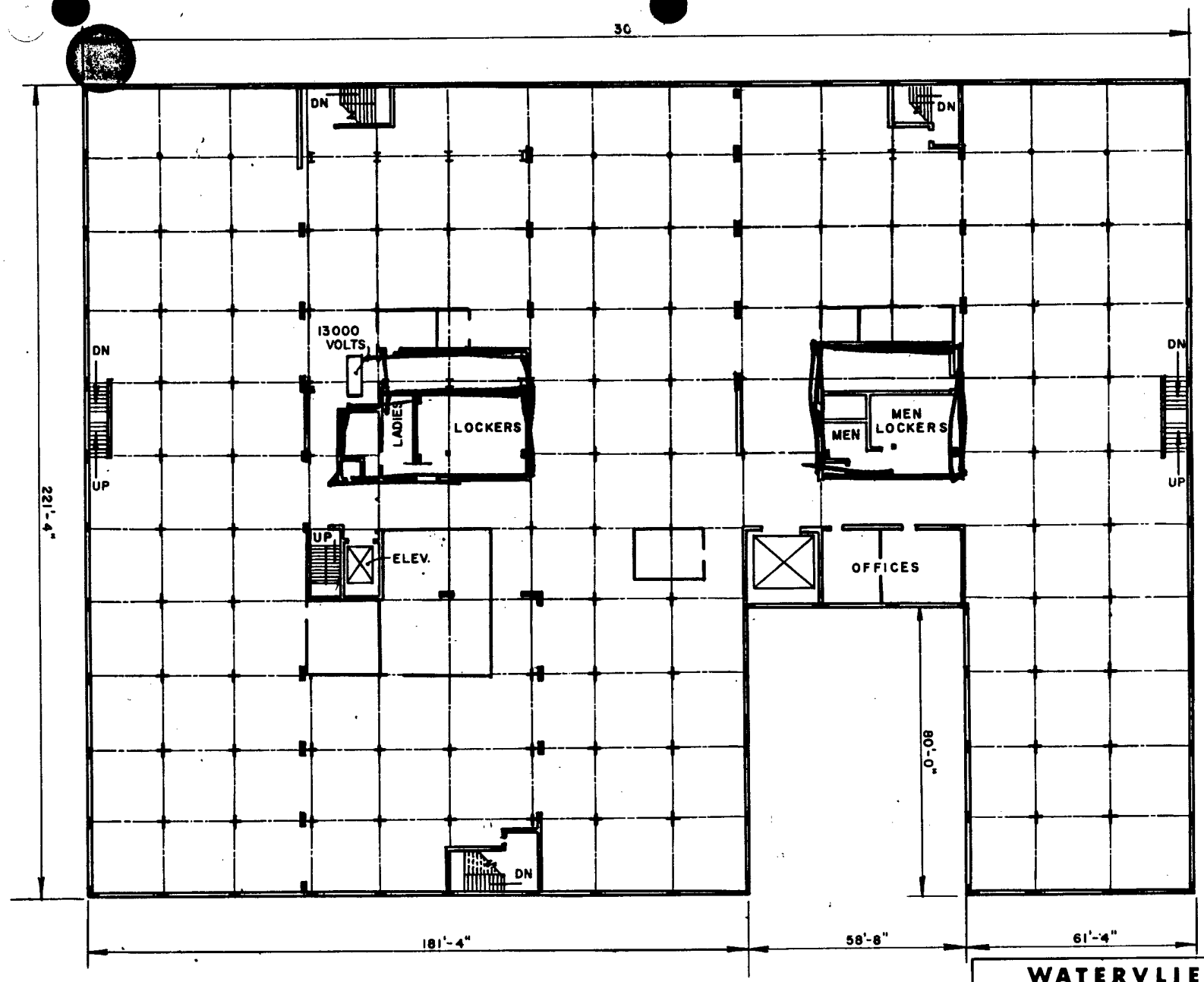
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by: J. C. Kachamian

FIRST FLOOR PLAN
MACHINE SHOP
BUILDING NO. 25

Revisions	Date

Scale: 40'=1'-0" Date:



30

NET FLOOR AREA
Square feet

FLOOR CAPACITY
Per square foot

N

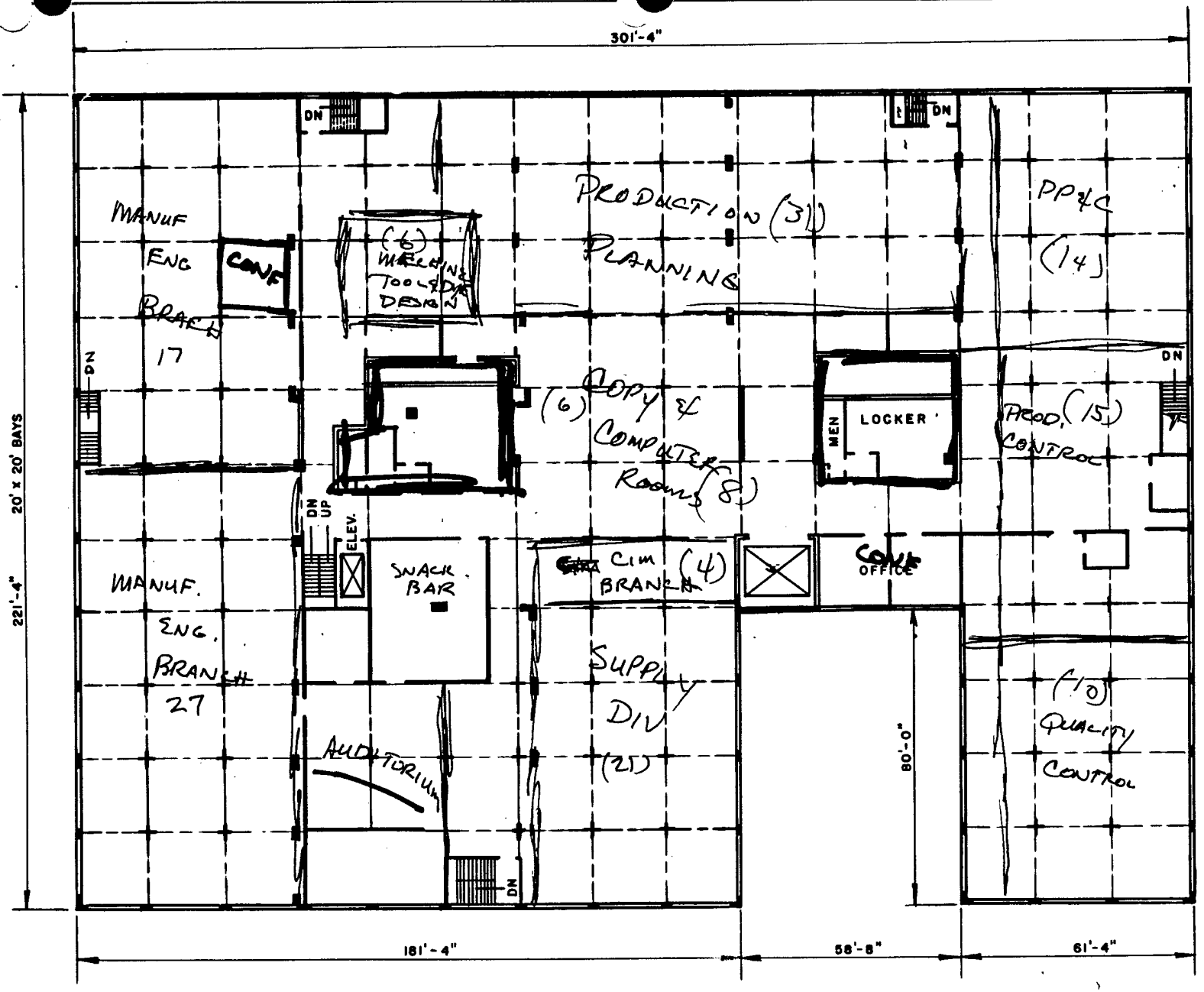
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR PLAN
MACHINE SHOP
BUILDING NO. 25

Scale: 1"= 40'-0" Date:

Revisions	Date

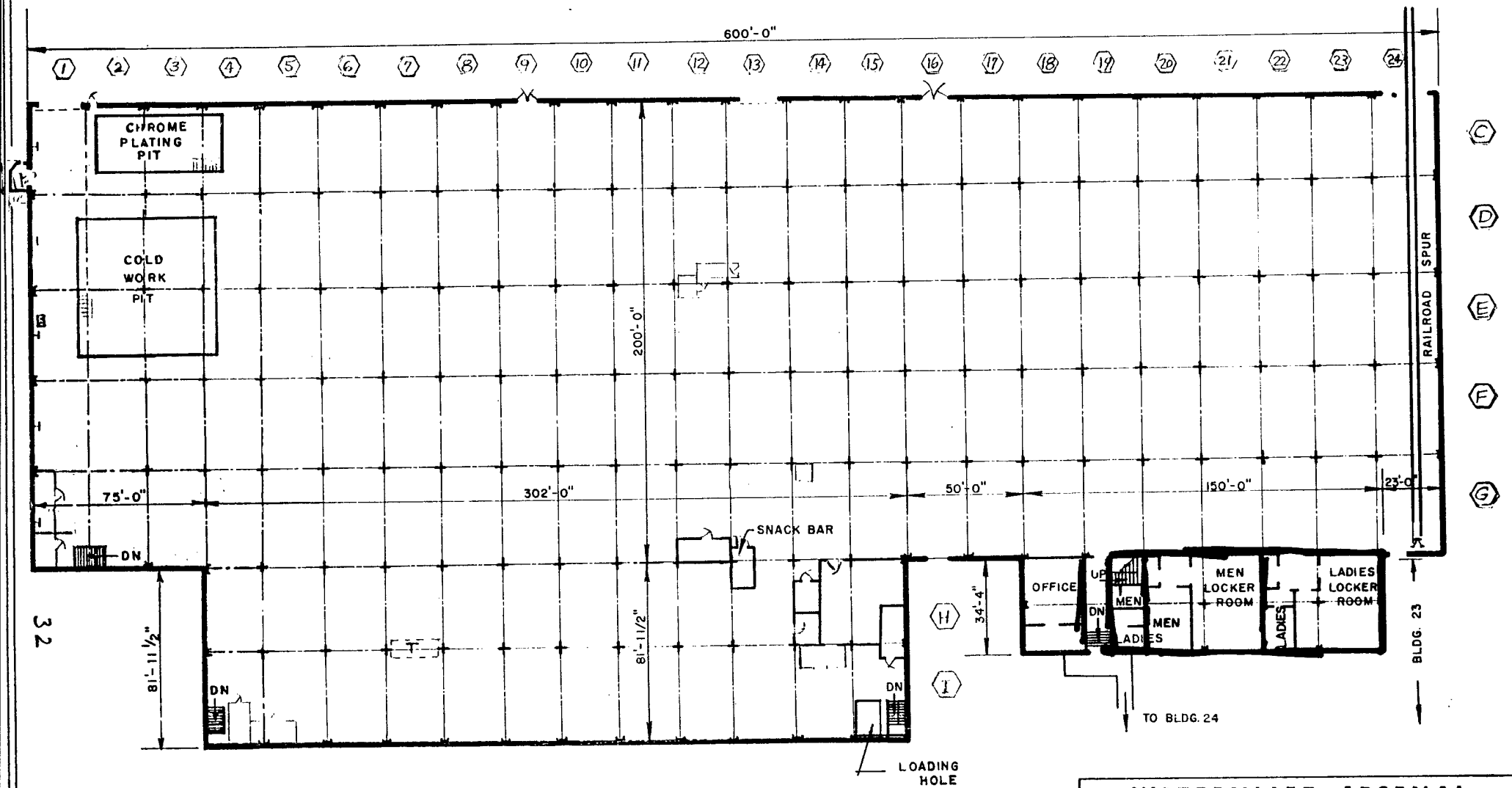


NET FLOOR AREA
Square feet
61,990
FLOOR CAPACITY

WATERVLIET ARSENAL
WATERVLIET, N.Y.
Drawn by: J.R.GANGEMI, [redacted] by:

Revisions	Date

THIRD FLOOR PLAN
MACHINE SHOP
BUILDING NO. 25



NET FLOOR AREA
151,000
Square feet

FLOOR CAPACITY

Per square foot

N

WATERVLIET ARSENAL

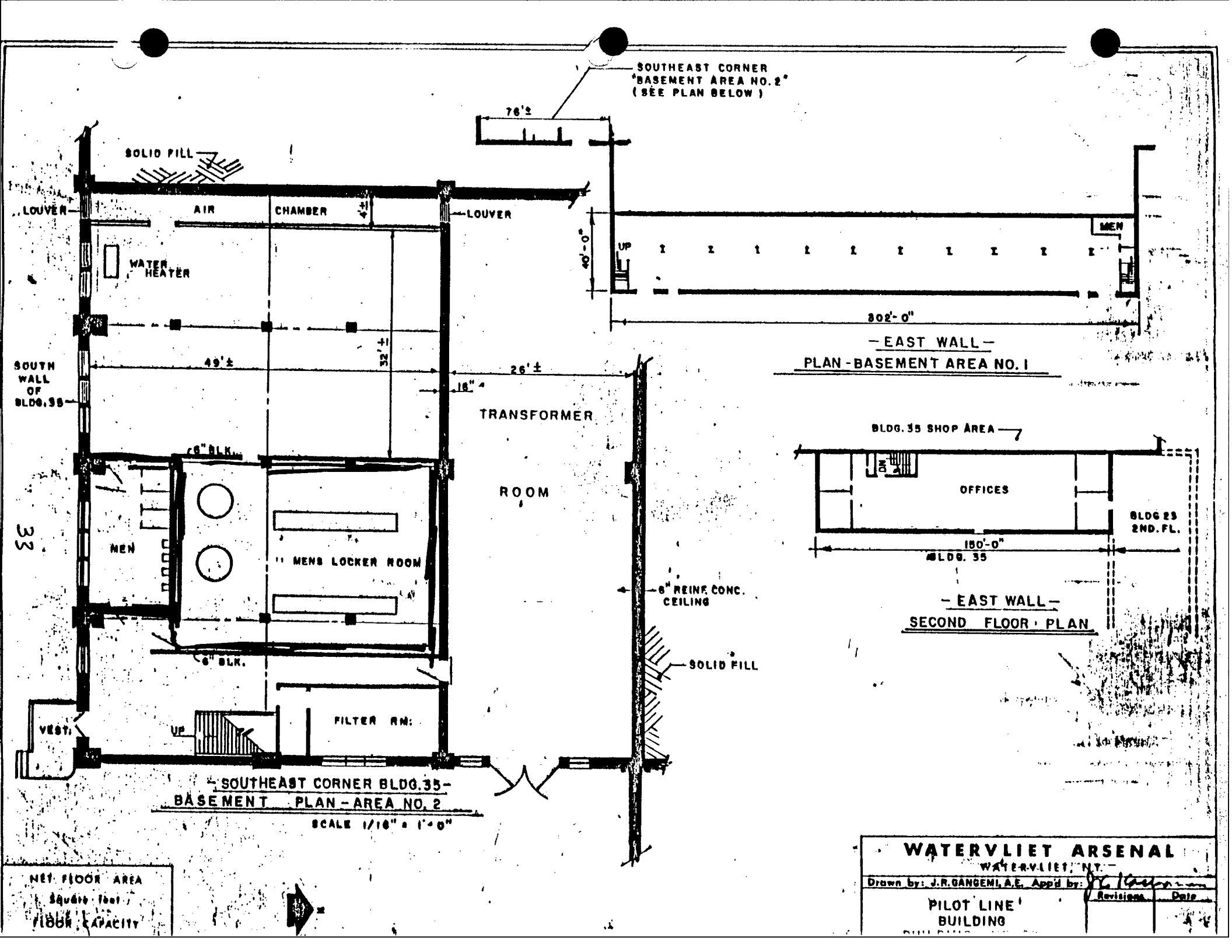
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

MAIN FLOOR PLAN
PILOT LINE BUILDING
BUILDING NO. 35

Scale: 1"= 60'-0" Date:

Revisions	Date
EL	6/74


SOUTHEAST CORNER
"BASEMENT AREA NO. 2"
(SEE PLAN BELOW)
76'±
SOLID FILL
LOUVER
AIR CHAMBER
LOUVER
WATER HEATER
SOUTH WALL OF BLDG. 35
49'±
32'±
26'±
16"
TRANSFORMER ROOM
8" BLK.
MEN
MENS LOCKER ROOM
6" REINF. CONC. CEILING
8" BLK.
SOLID FILL
VEST.
UP
FILTER RM.
40'-0"
UP
MEN
302'-0"
EAST WALL
PLAN - BASEMENT AREA NO. 1
BLDG. 35 SHOP AREA
DN
OFFICES
BLDG 23 2ND. FL.
150'-0"
BLDG. 35
EAST WALL
SECOND FLOOR PLAN
SOUTHEAST CORNER BLDG. 35
BASEMENT PLAN - AREA NO. 2
SCALE 1/16" = 1'-0"
NET FLOOR AREA
Square feet
FLOOR CAPACITY
WATERVLIET ARSENAL
WATERVLIET, N.Y.
Drawn by: J.R. GANGEMI, A.E. Appd by:
Revisions
Date
PILOT LINE
BUILDING

NET FLOOR AREA
138,969
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

WATERVLIET ARSENAL

WATERVLIET, N.Y.

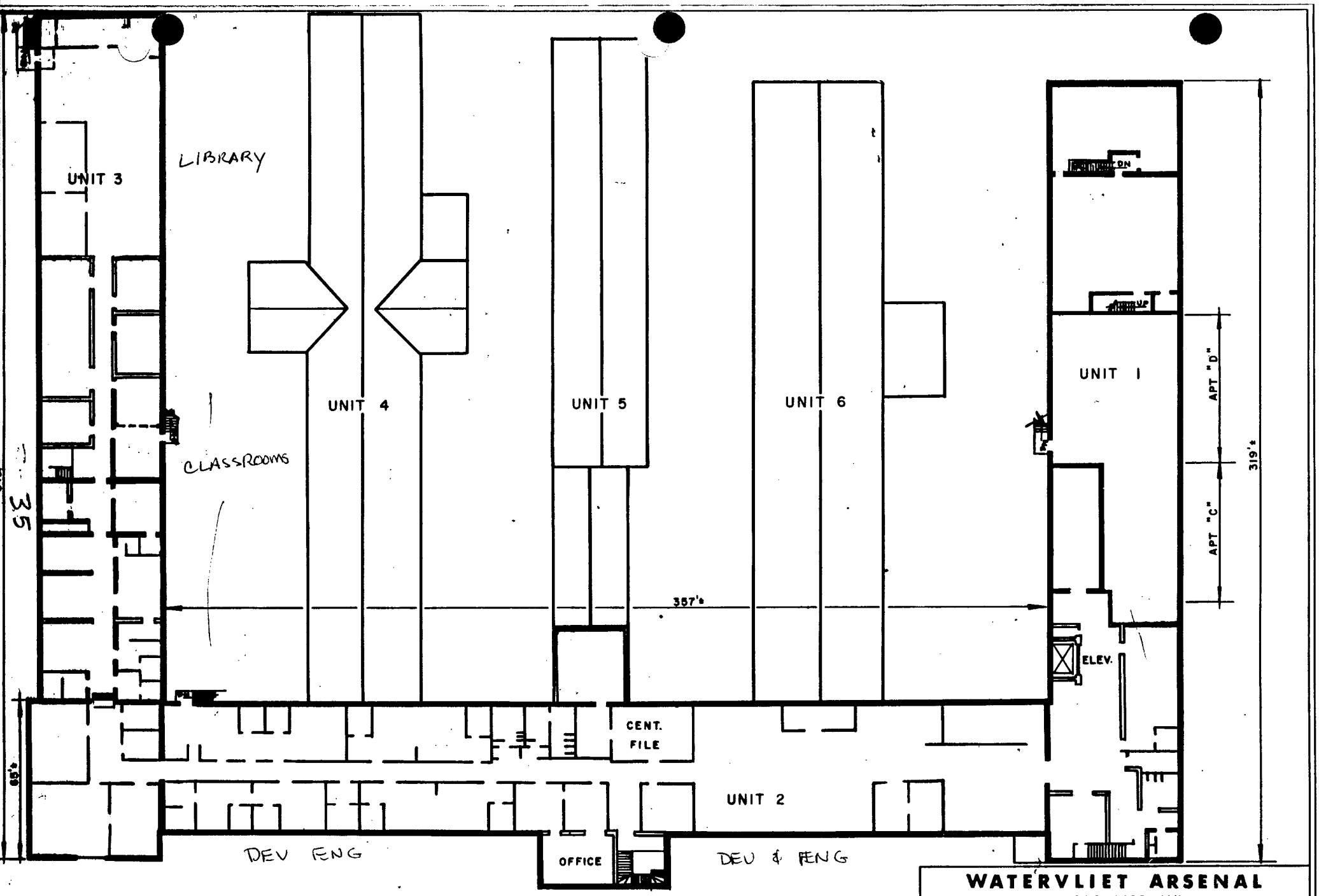
Drawn by: J.R.GANGEMI, A.E. App'd by:

FIRST FLOOR PLAN
BENET LABORATORIES
BUILDING NO. 40

Scale: NO SCALE Date:

Revisions	Date

34



NET FLOOR AREA
Square feet

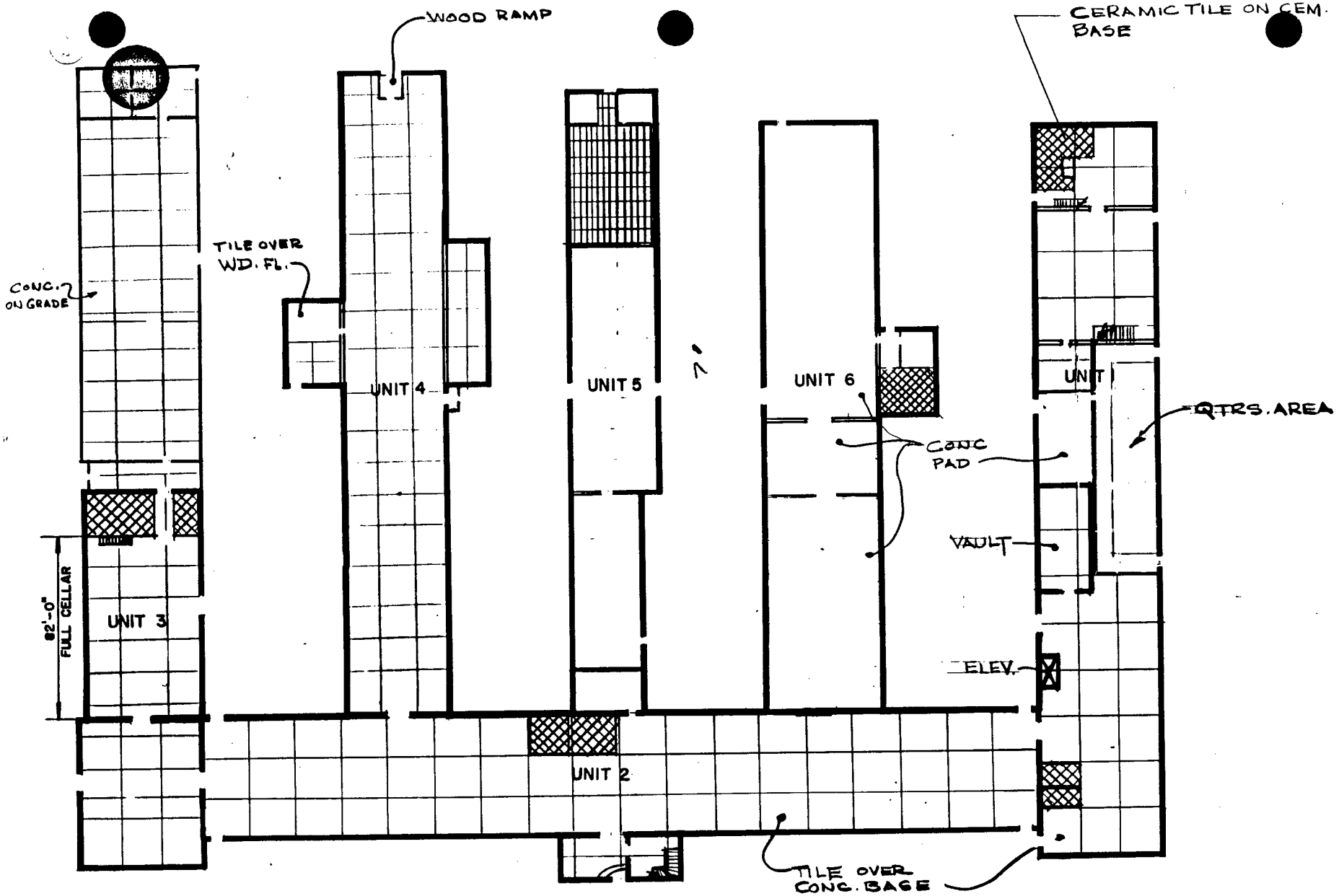
FLOOR CAPACITY
84 LBS
Per square foot

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. [illegible] by:

SECOND FLOO
BENET LABORATOR
BUILDING NO. 40

Revisions	Date



BASEMENT

NET FLOOR AREA
Square feet
FLOOR CAPACITY
Per square foot

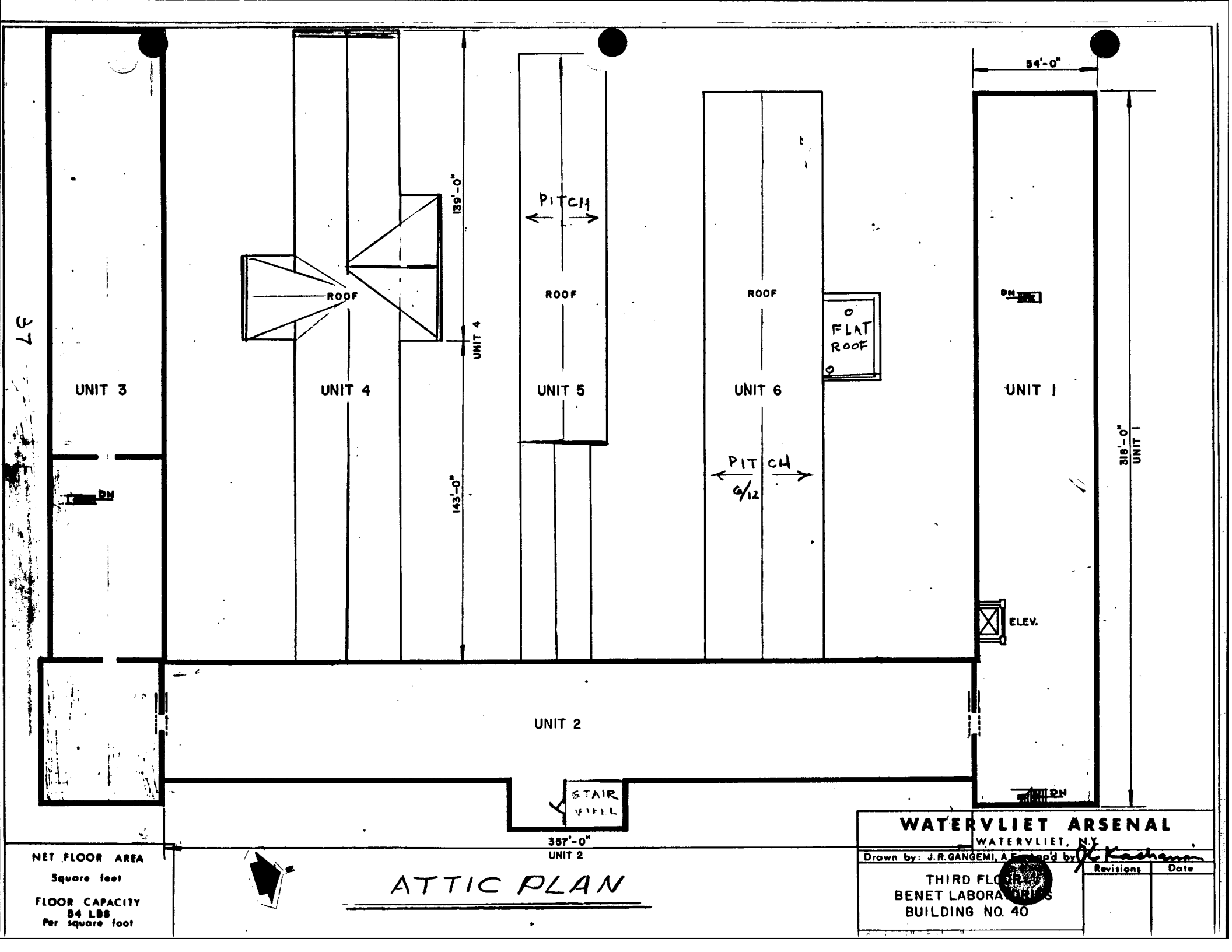
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

BENET LABORATORIES
BUILDING NO. 40

Scale: 1" = 60'-0" Date:

Revisions	Date



ATTIC PLAN

NET FLOOR AREA
Square feet

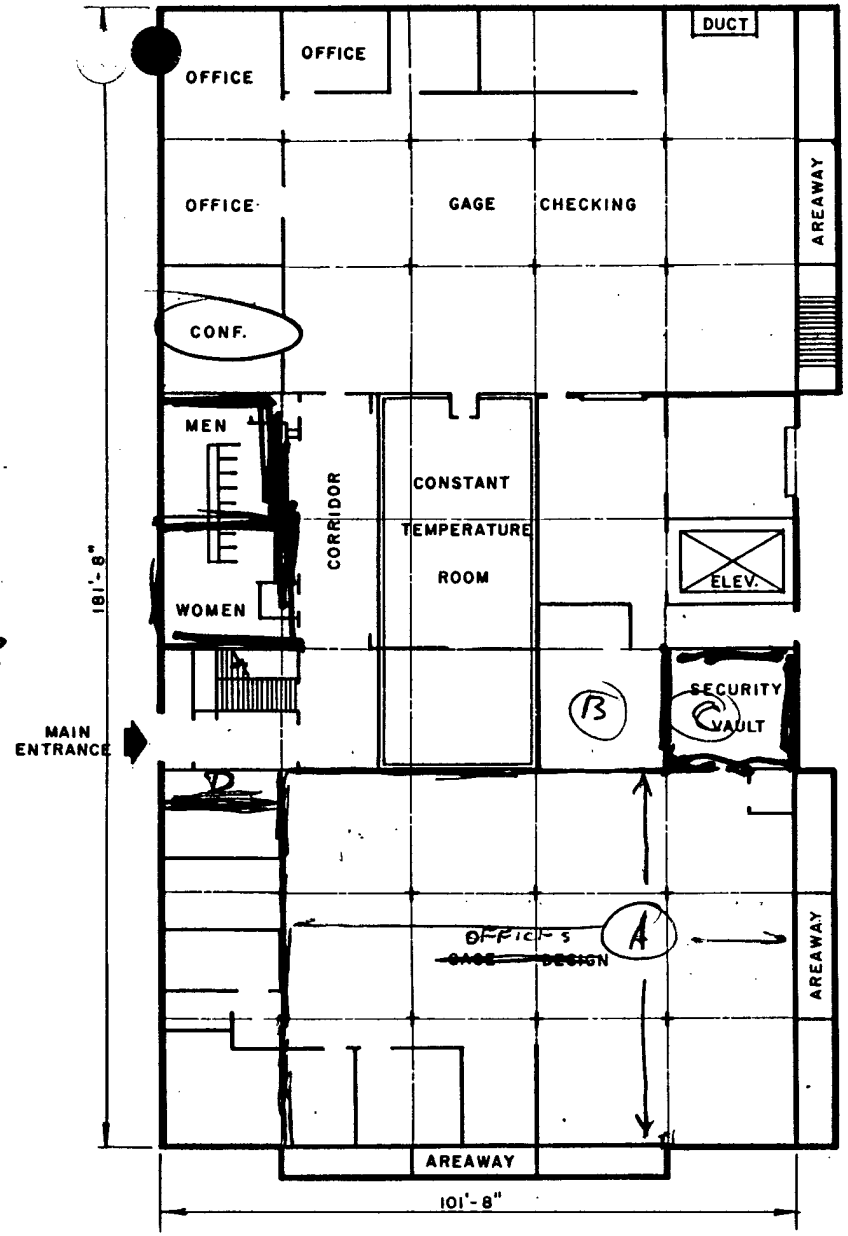
FLOOR CAPACITY
84 LBS
Per square foot

WATERVLIET ARSENAL
WATERVLIET, N.Y.

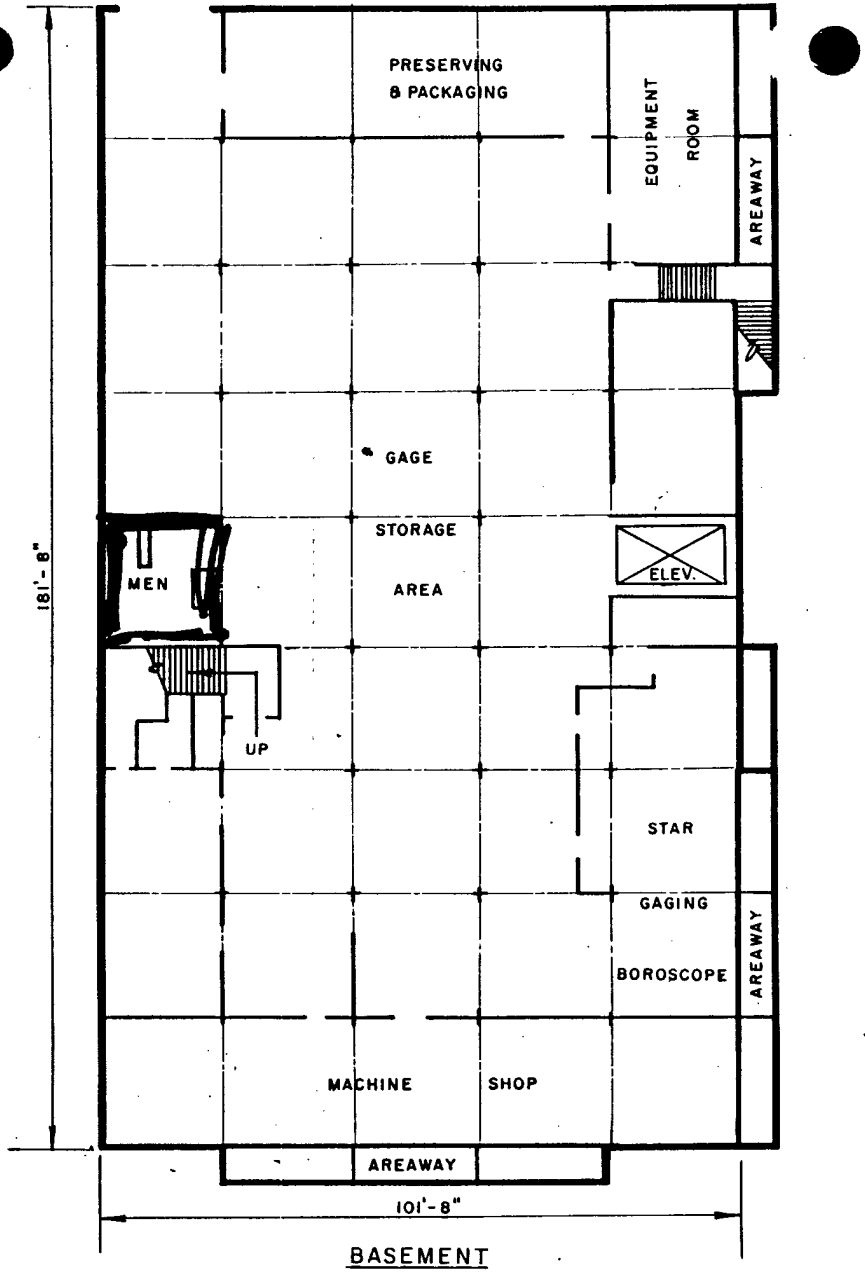
Drawn by: J.R.GANGEMI, A.E. Approv'd by: [signature]

THIRD FLOOR
BENET LABORATORIES
BUILDING NO. 40

Revisions	Date



FIRST FLOOR



BASEMENT

TOTAL DIMENSIONS
100' x 300' = 30,000 FT²/FL
= 60,000 FT²

NET FLOOR AREA
Square feet
FLOOR CAPACITY 1ST FL. 100LBS - 2ND FL. 100LBS Per square foot

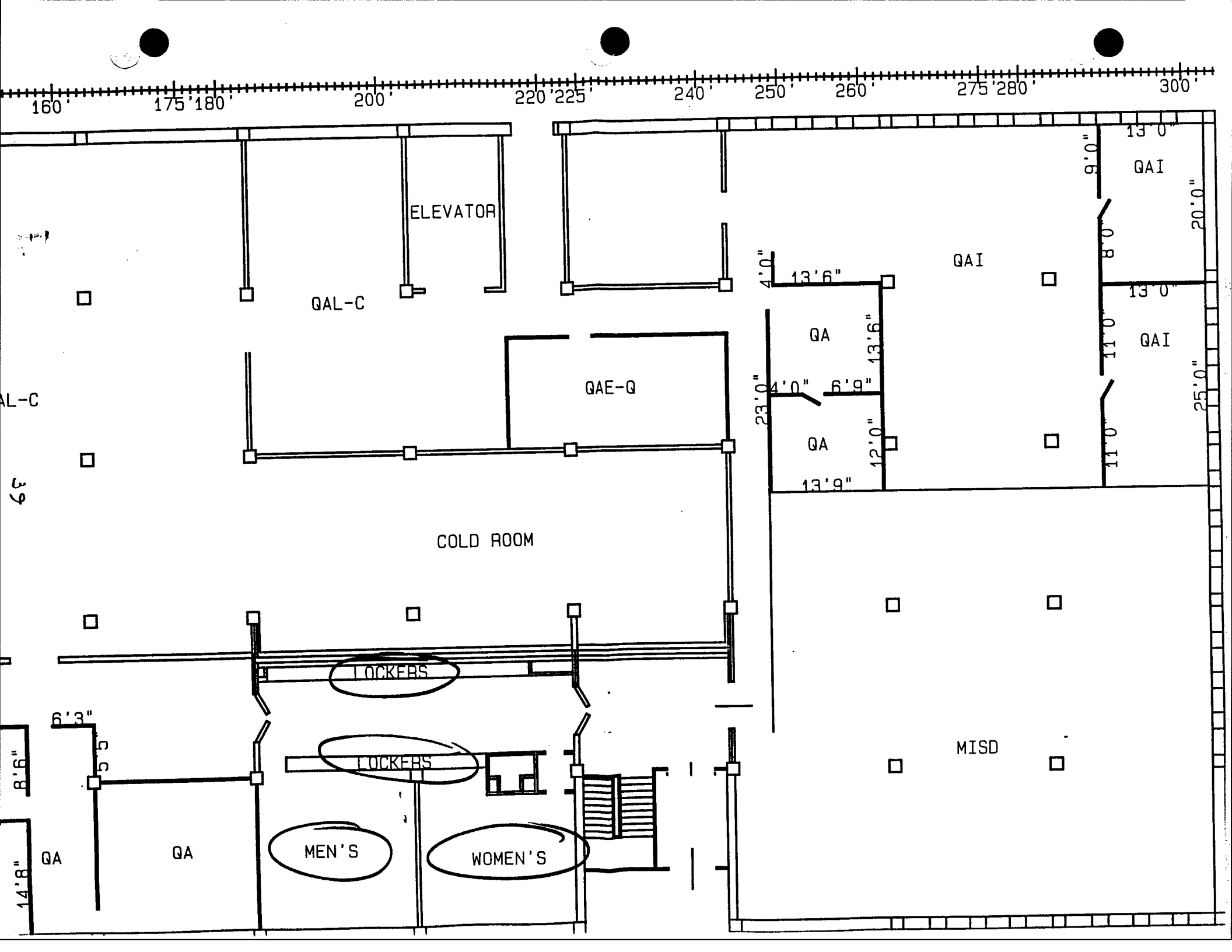
WATERVLIET ARSENAL
WATERVLIET, N.Y.

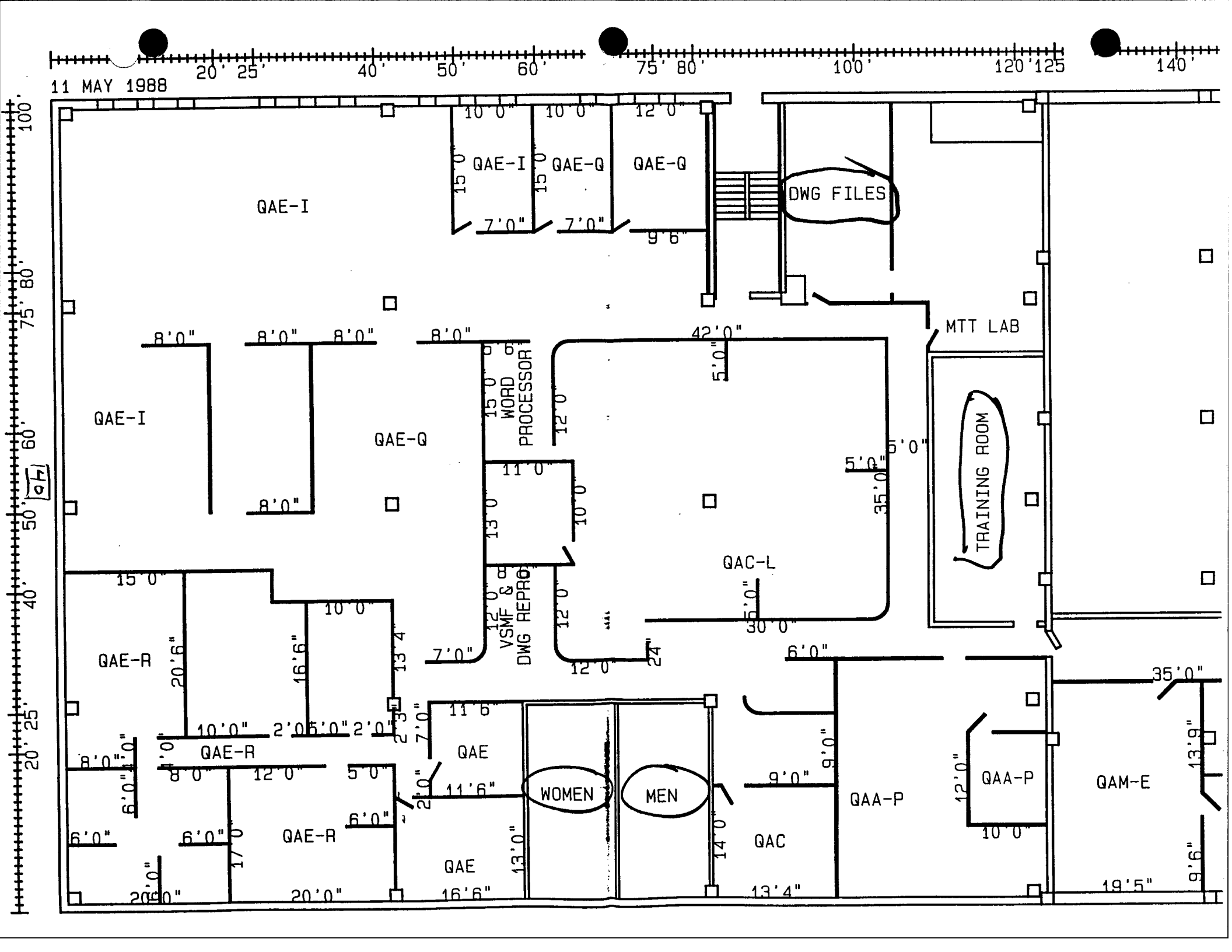
Drawn by: J.R.GANGEMI, A.E. App'd by:

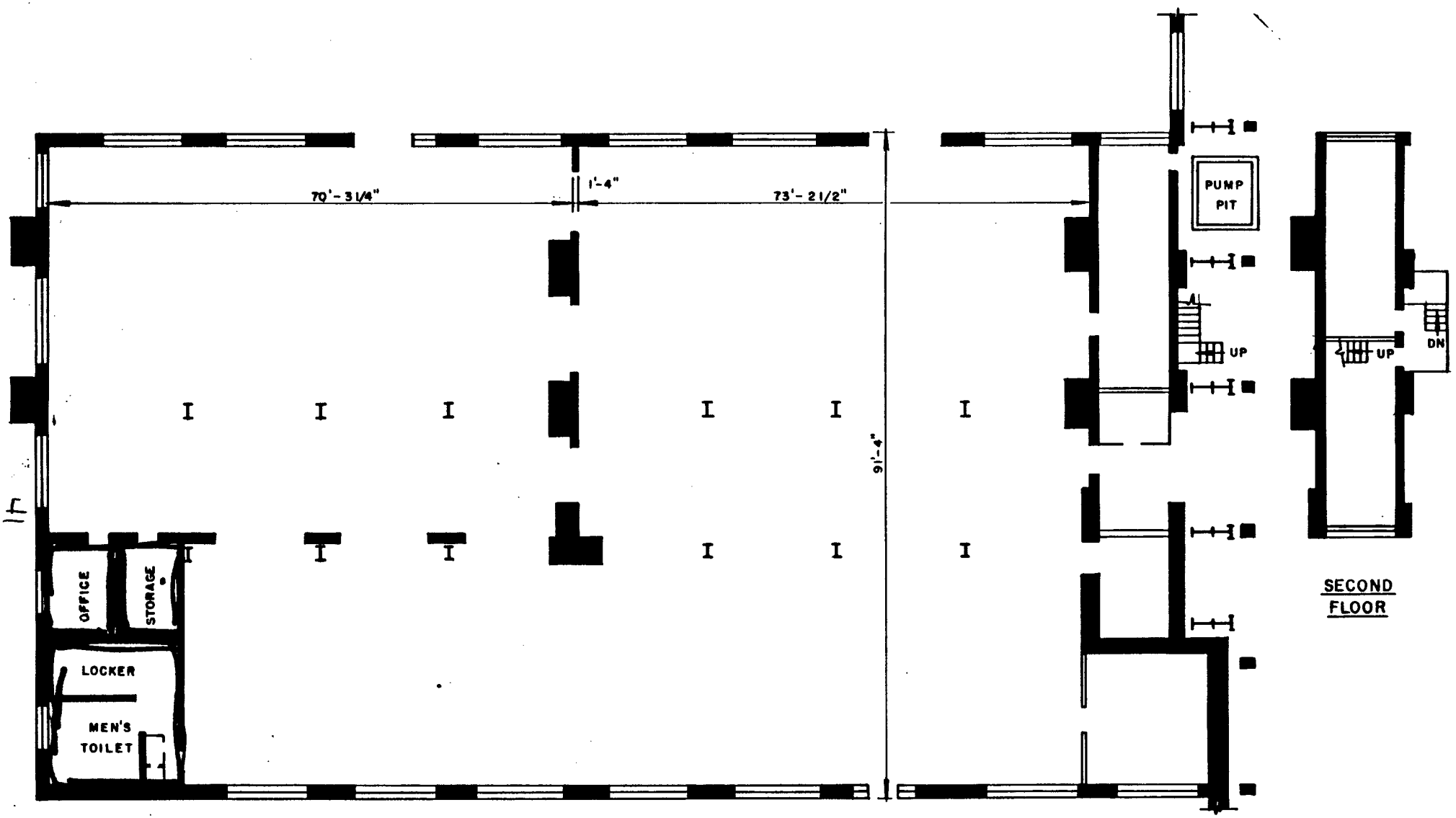
DALLIBA HALL
BUILDING NO. 44

Scale: 1"= 30'-0" Date:

Revisions	Date


160'
175'
180'
200'
220'
225'
240'
250'
260'
275'
280'
300'
ELEVATOR
QAL-C
QAE-Q
QAI
QA
COLD ROOM
LOCKERS
LOCKERS
MEN'S
WOMEN'S
MISD
13'6"
4'0"
13'9"
6'9"
23'0"
12'0"
9'0"
8'0"
11'0"
25'0"
20'0"
6'3"
5'5"
8'6"
14'8"


11 MAY 1988
QAE-I
QAE-I
QAE-Q
QAE-Q
QAE-I
QAE-Q
DWG FILES
MTT LAB
WORD PROCESSOR
VSMF & DWG REPRO
QAC-L
TRAINING ROOM
QAE-R
QAE-R
QAE-R
QAE
QAE
WOMEN
MEN
QAC
QAA-P
QAA-P
QAM-E



SECOND FLOOR

MAIN FLOOR
HEAT TREAT WING

NET FLOOR AREA
Square feet

FLOOR CAPACITY
1ST. FL. 1,000 LBS - 2ND. FL. 200L
Per square foot

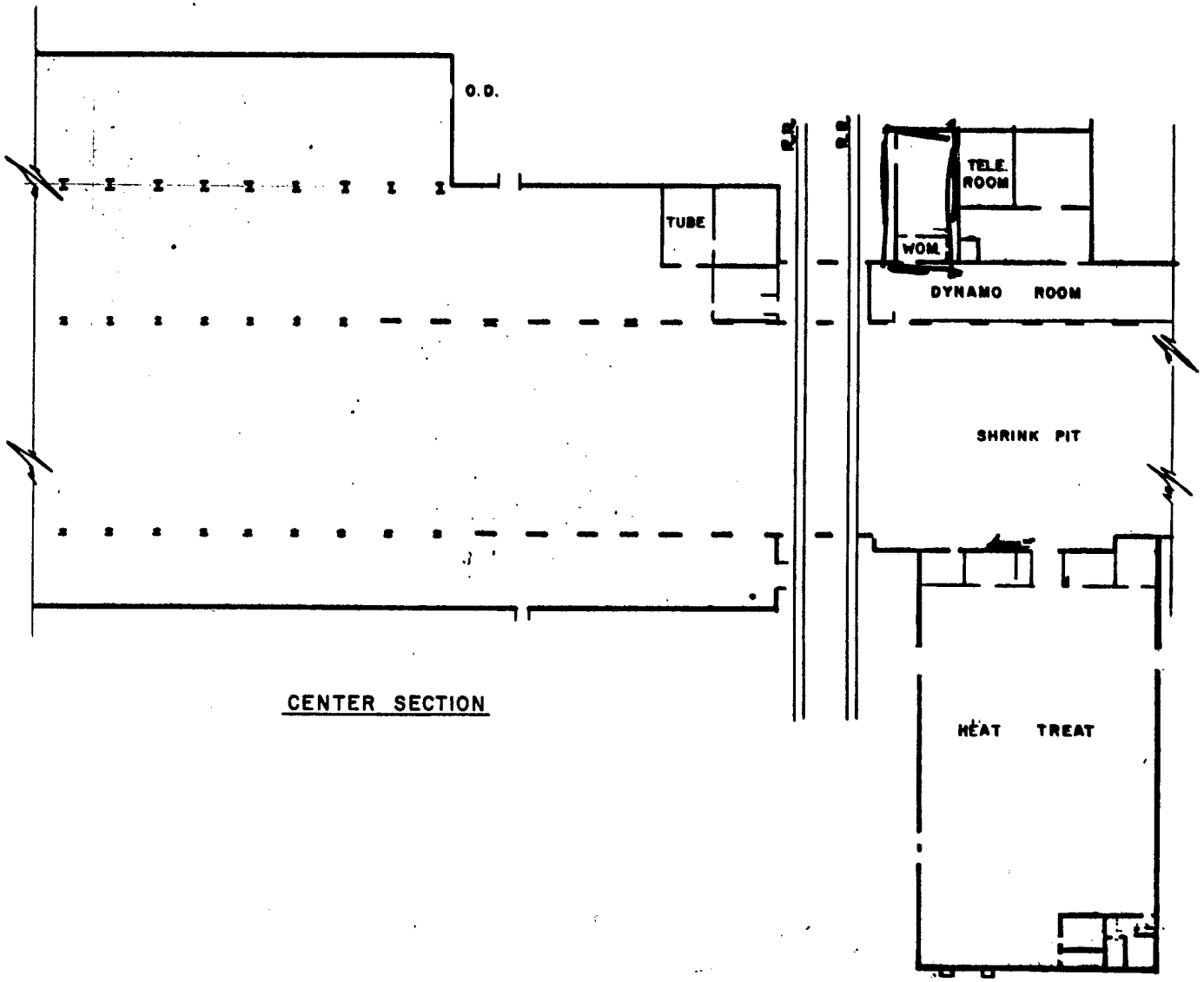
N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R. GANGEMI, A.E. App'd by: J. R. Kashman

Revisions	Date

HEAVY CALIBER
TUBE SHOP
BUILDING NO. 110



CENTER SECTION

42

NET FLOOR AREA
211 625
Square feet

FLOOR CAPACITY
1000-200-200 LBS
Per square foot

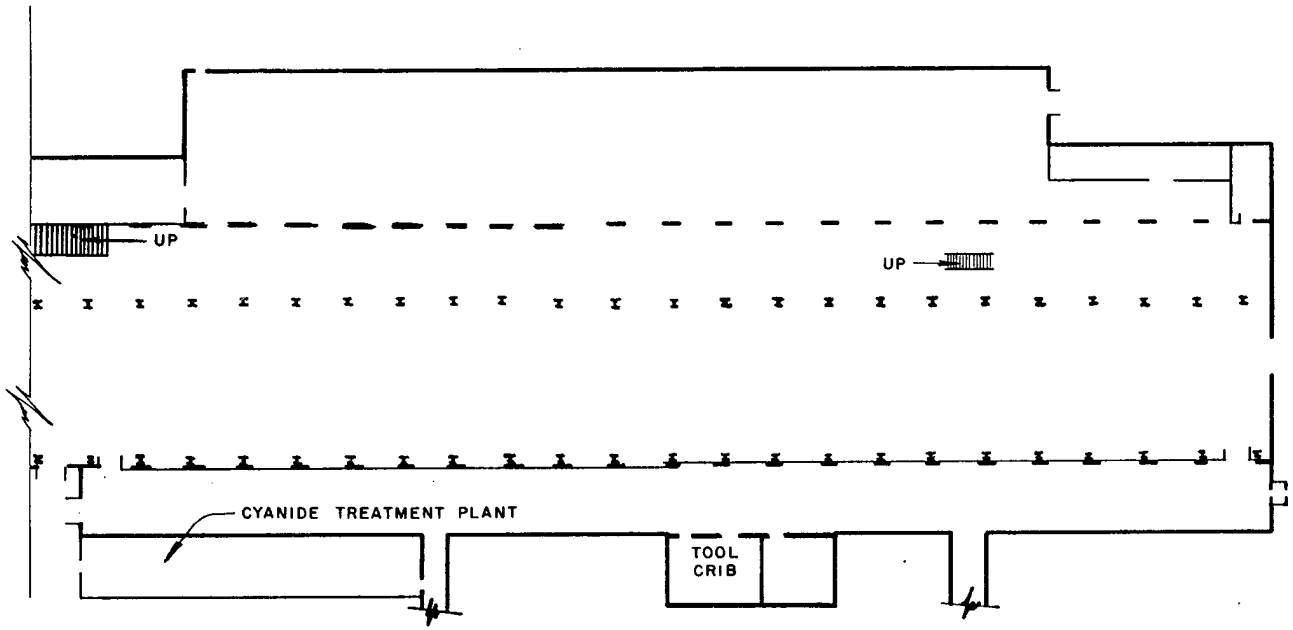
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.SANSEMI, A.E. Appd by:

HEAVY CALIBER
TUBE SHOP
BUILDING NO. 110

Revisions	Date

Scale: 1"=40'-0" Date:



NORTH END

NET FLOOR AREA
211625
Square feet

FLOOR CAPACITY
1000-200-200 LBS
Per square foot

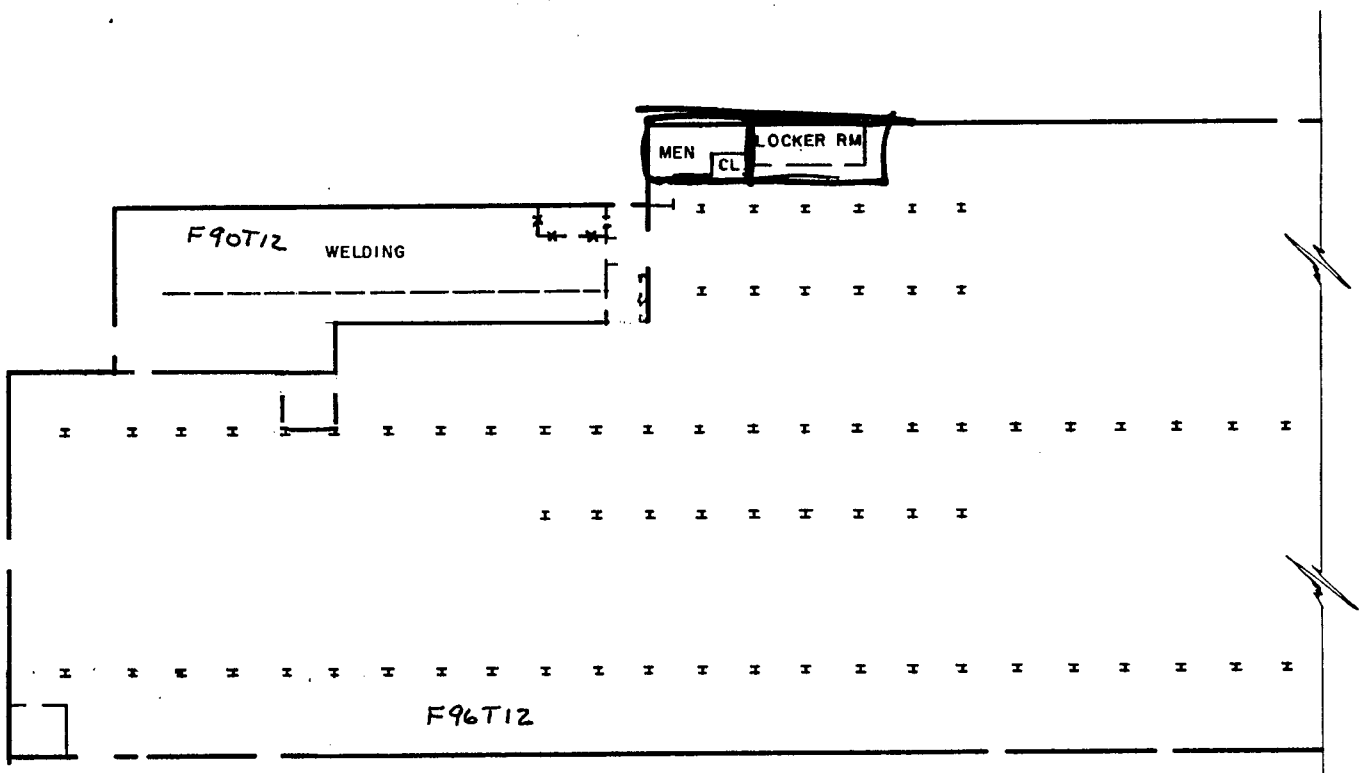
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

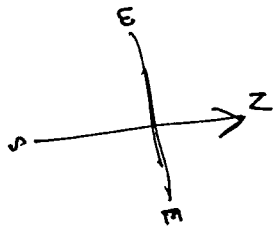
HEAVY CALIBER
TUBE SHOP
BUILDING NO. 110

Scale: 1" = 40'-0" Date:

Revisions	Date



SOUTH END



NET FLOOR AREA
211,625
Square feet

FLOOR CAPACITY
1000-200-200 LBS
Per square foot

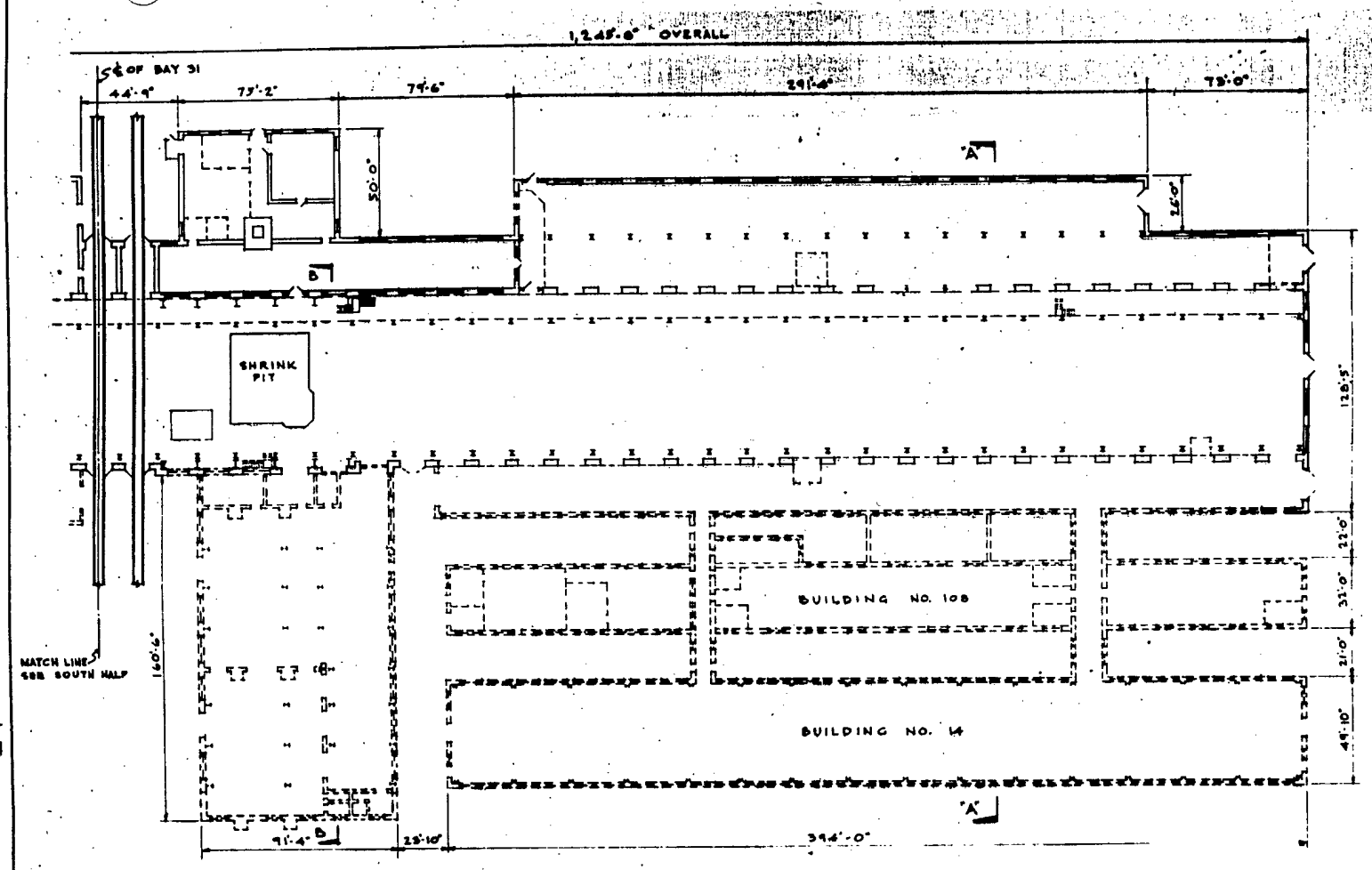
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

Revisions	Date

HEAVY CALIBER
TUBE SHOP
BUILDING NO. 110

Scale: 1" = 40'-0" Date:

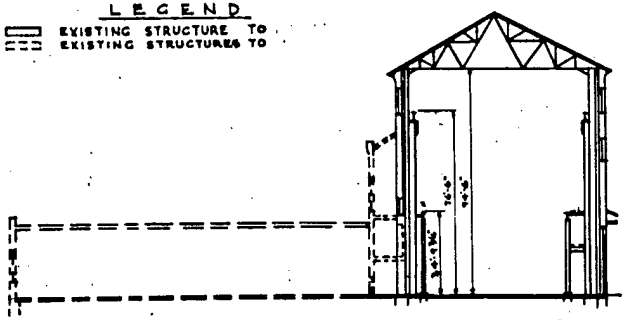


BUILDING # 110
KEY PLAN

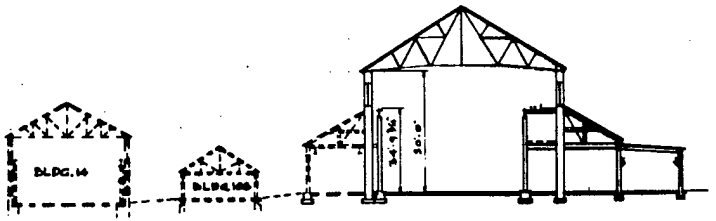
OUTLINE SPECIFICATIONS

LEGEND
EXISTING STRUCTURE TO
EXISTING STRUCTURES TO

FIRST FLOOR PLAN
SCALE 1" = 40'

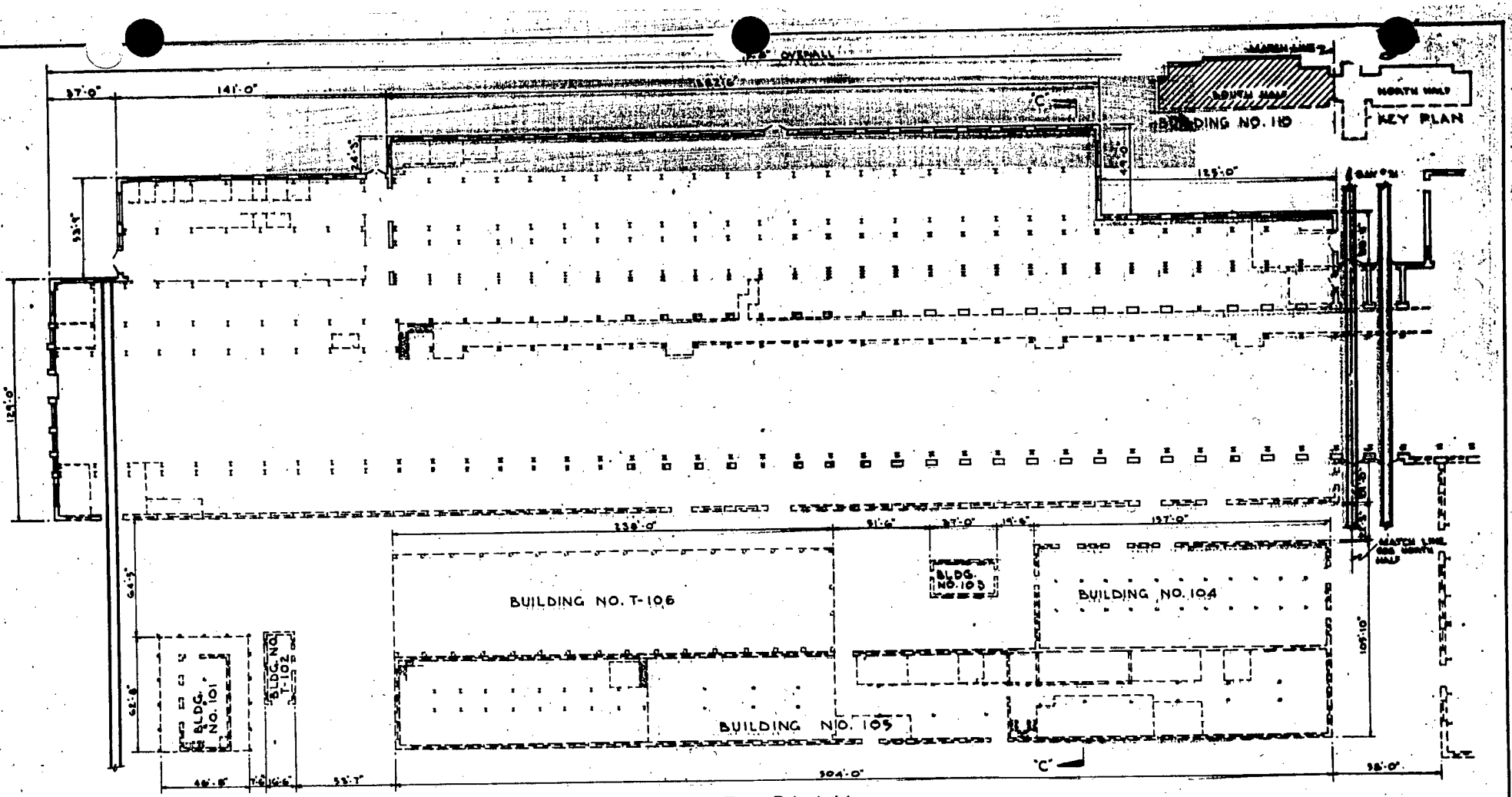


SECTION "B-B"
SCALE 1" = 40'



SECTION "A-A"
SCALE 1" = 40'

BUILDING NO. 110
FLOOR PLAN - NORTH HALF



FIRST FLOOR PLAN
SCALE 1"=40'-0"

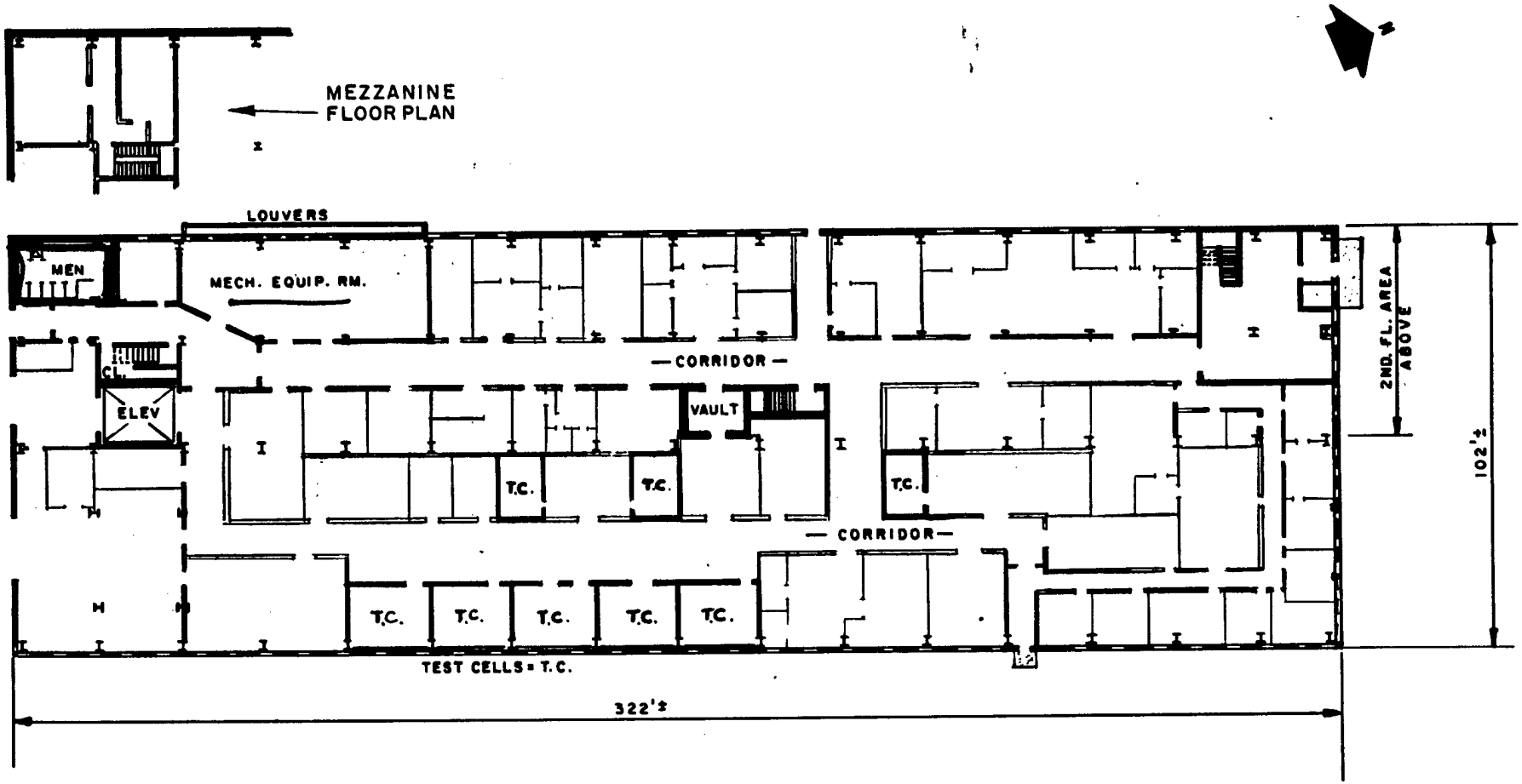
LEGEND
EXISTING STRUCTURE TO
EXISTING STRUCTURES TO

SECTION "C-C"
SCALE 1"=40'-0"

OUTLINE SPECIFICATIONS

BUILDING NO. 110
FLOOR PLAN - SOUTH HALF

94



LH

32,500
15,500
58,000 FT²

NET FLOOR AREA
32,500
SQUARE FEET

FLOOR CAPACITY
1,000 LBS / SQ. FT.

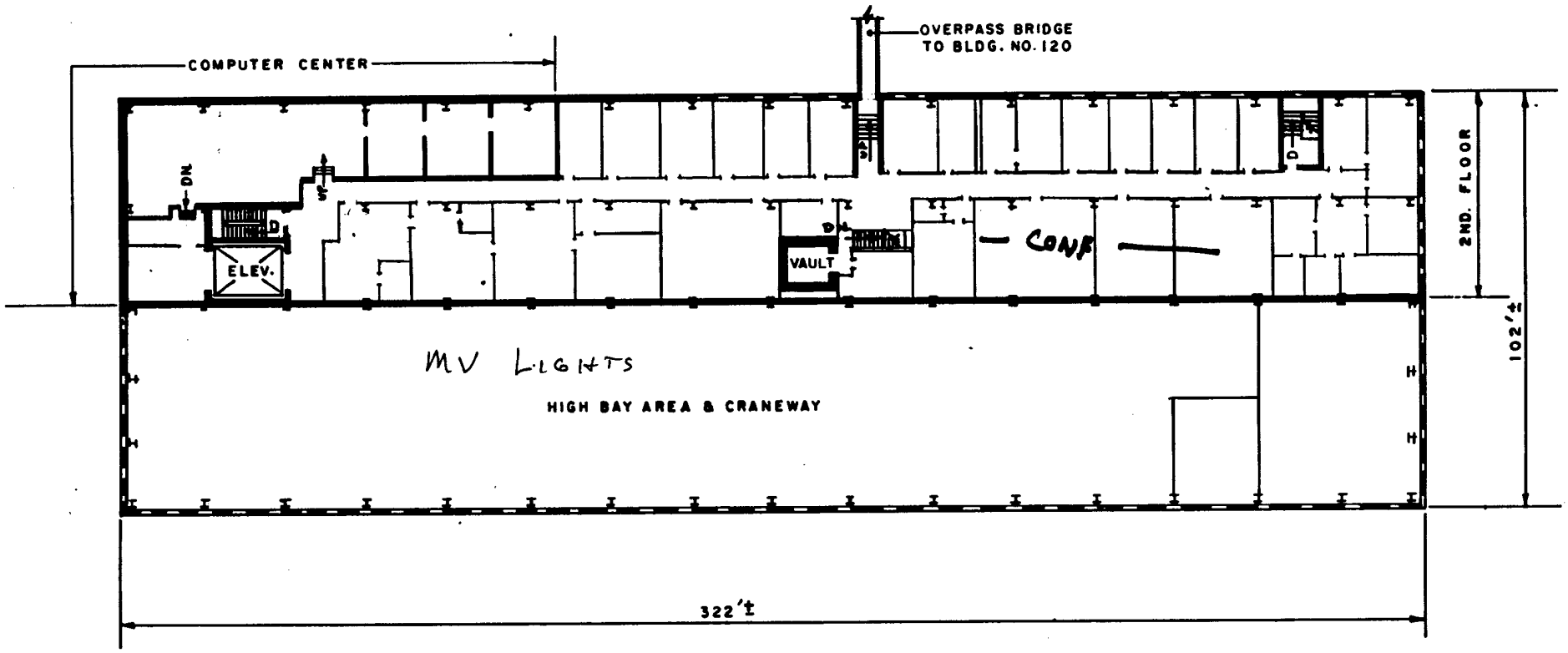
WATERVLIET ARSENAL
WATERVLIET, N.Y.

DRAWN BY: E. LANSBURG APPD. BY:

FIRST FLOOR
MAGGS RESEARCH [illegible]R
BUILDING NO. [illegible]

REV.	DATE
EL	2/76
TR	4/76

SCALE : 1" = 40'-0" DATE



NET FLOOR AREA
15,500 SQ. FT.

FLOOR CAPACITY
300 LBS./SQ. FT.

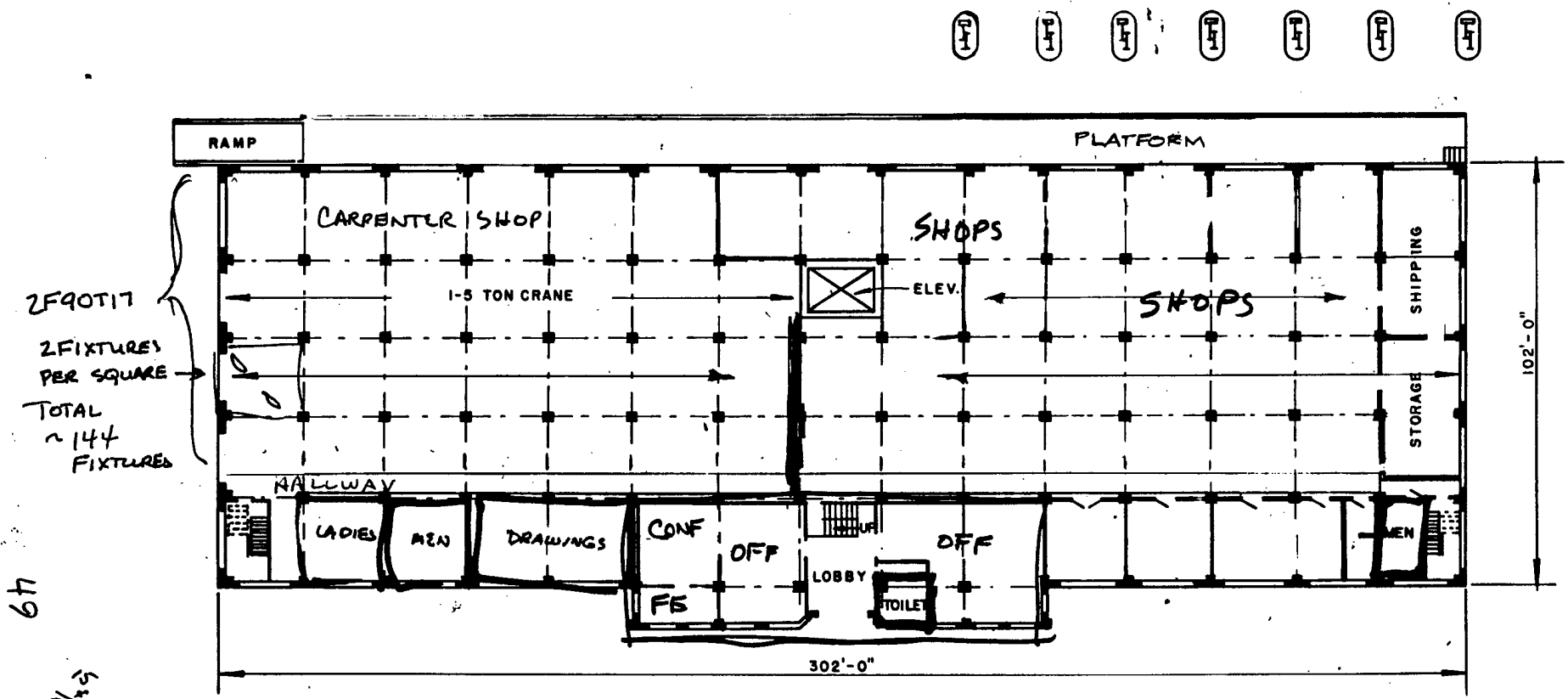
WATERVLIET ARSENAL

WATERVLIET, N.Y.

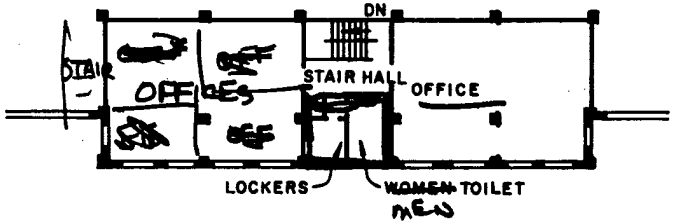
DRAWN BY: E. LANSBURG APPD. BY:

SECOND FLOOR PLAN
MAGGS RESEARCH CENTER
BUILDING NO. 115

REVISIONS	DATE
EL	2/76



BUILT 1941



MEZZANINE FLOOR PLAN

NET FLOOR AREA
31,000
SQUARE FEET
(FIRST FLOOR.)
FLOOR CAPACITY
1000 LBS
PER SQUARE FOOT
(FIRST FLOOR.)

NET FLOOR AREA
2,965
Square feet
(MEZZANINE FL.)
FLOOR CAPACITY
400 LBS

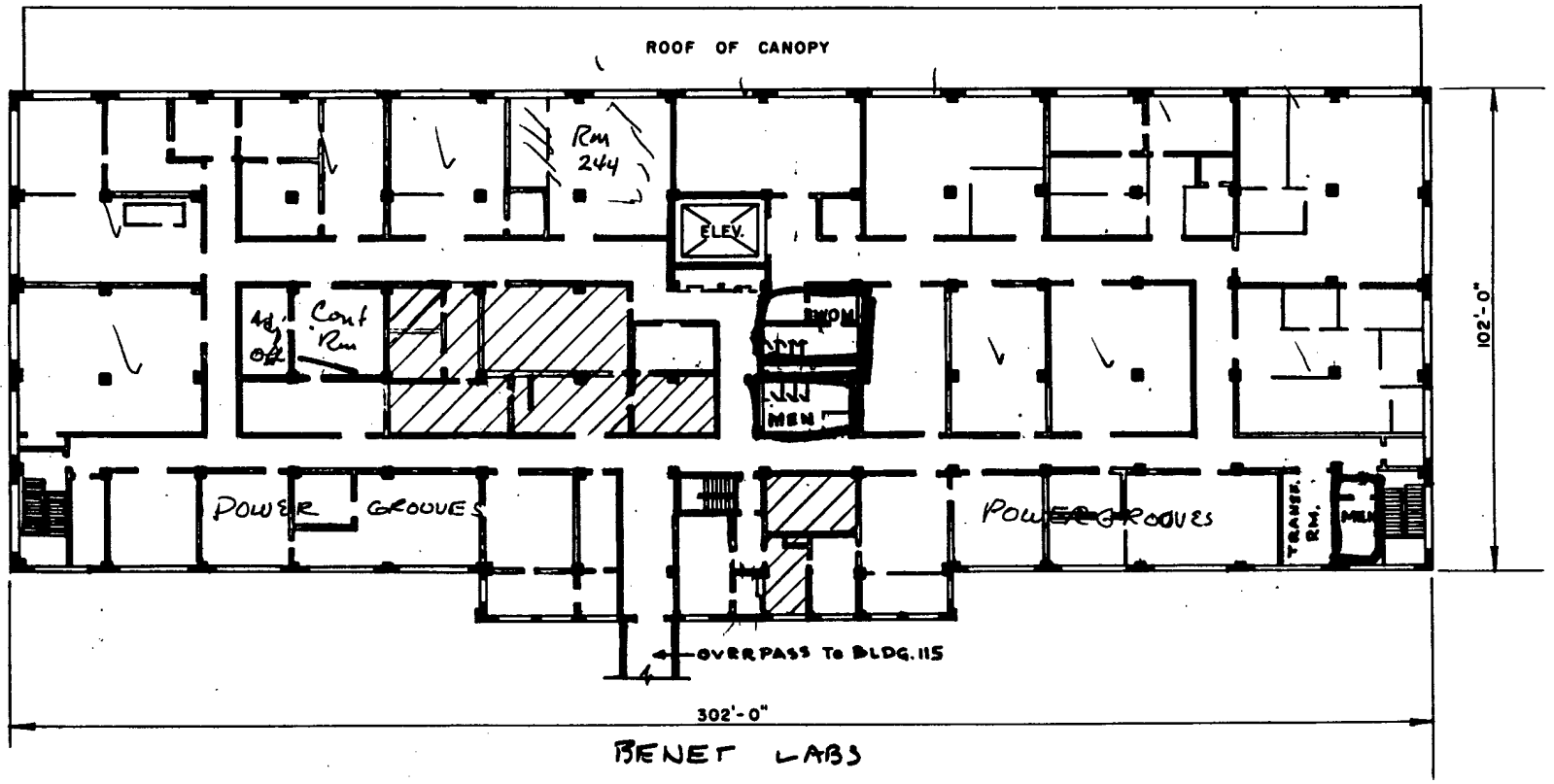
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A[redacted] by: [signature]

FIRST FLOOR PL[redacted]
AND MEZZANINE
SUPPLY BUILDING

Revisions	Date



BENET LABS

R & E LABS

NET FLOOR AREA
31,000
Square feet

FLOOR CAPACITY
400 LBS
Per square foot

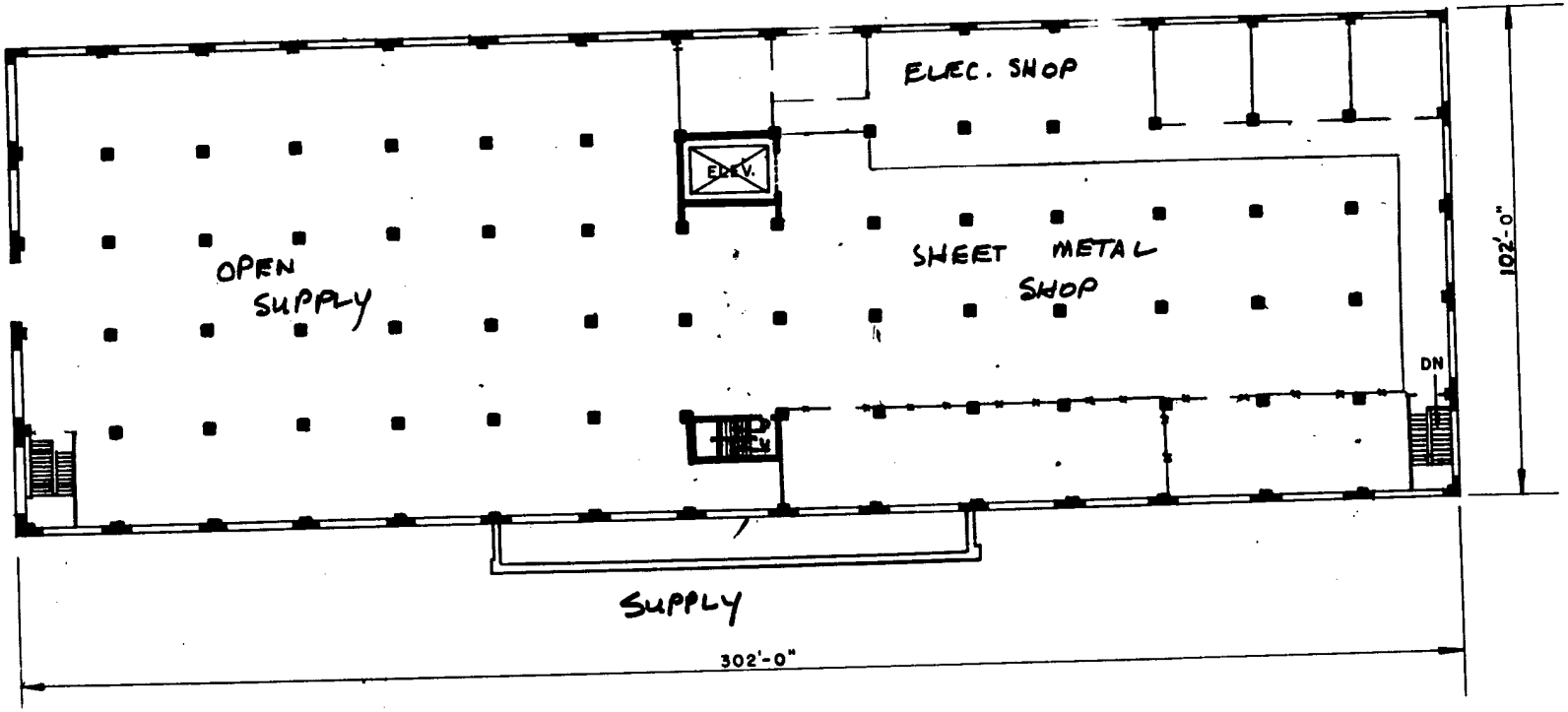
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR
R & E LA
BUILDING NO. 120

Scale: 1" = 40'-0" Date:

Revisions	Date



51

NET FLOOR AREA
30,000
Square feet

FLOOR CAPACITY
400 LBS

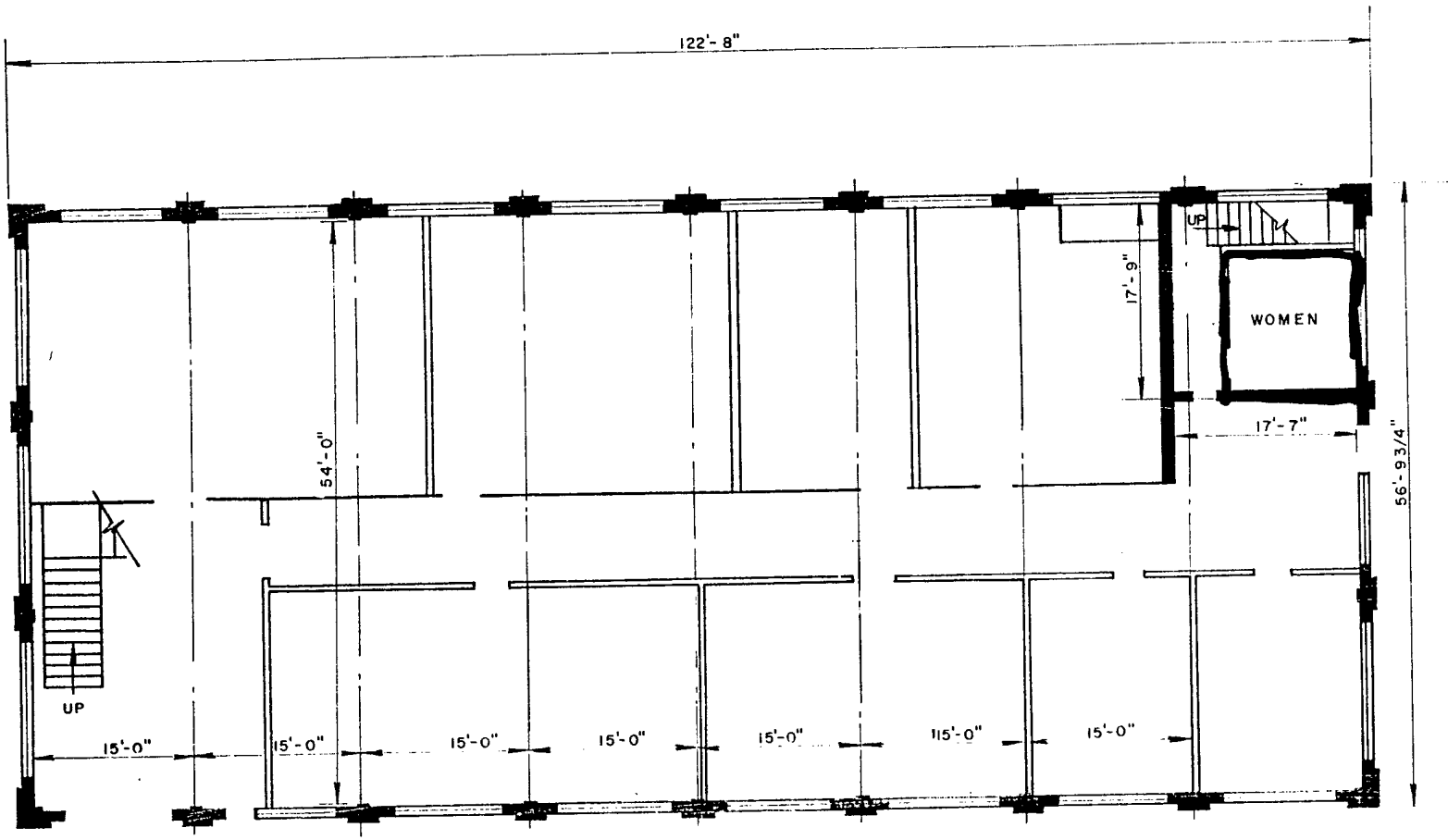
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI Appd by:

THIRD FLOOR PLAN
SUPPLY BUILDING
BUILDING NO. 120

Revisions	Date

Scale: 1" = 40'-0" Date:



52

NET FLOOR AREA
6,900
Square feet

FLOOR CAPACITY
1000 LBS & 40 LBS
Per square foot

N

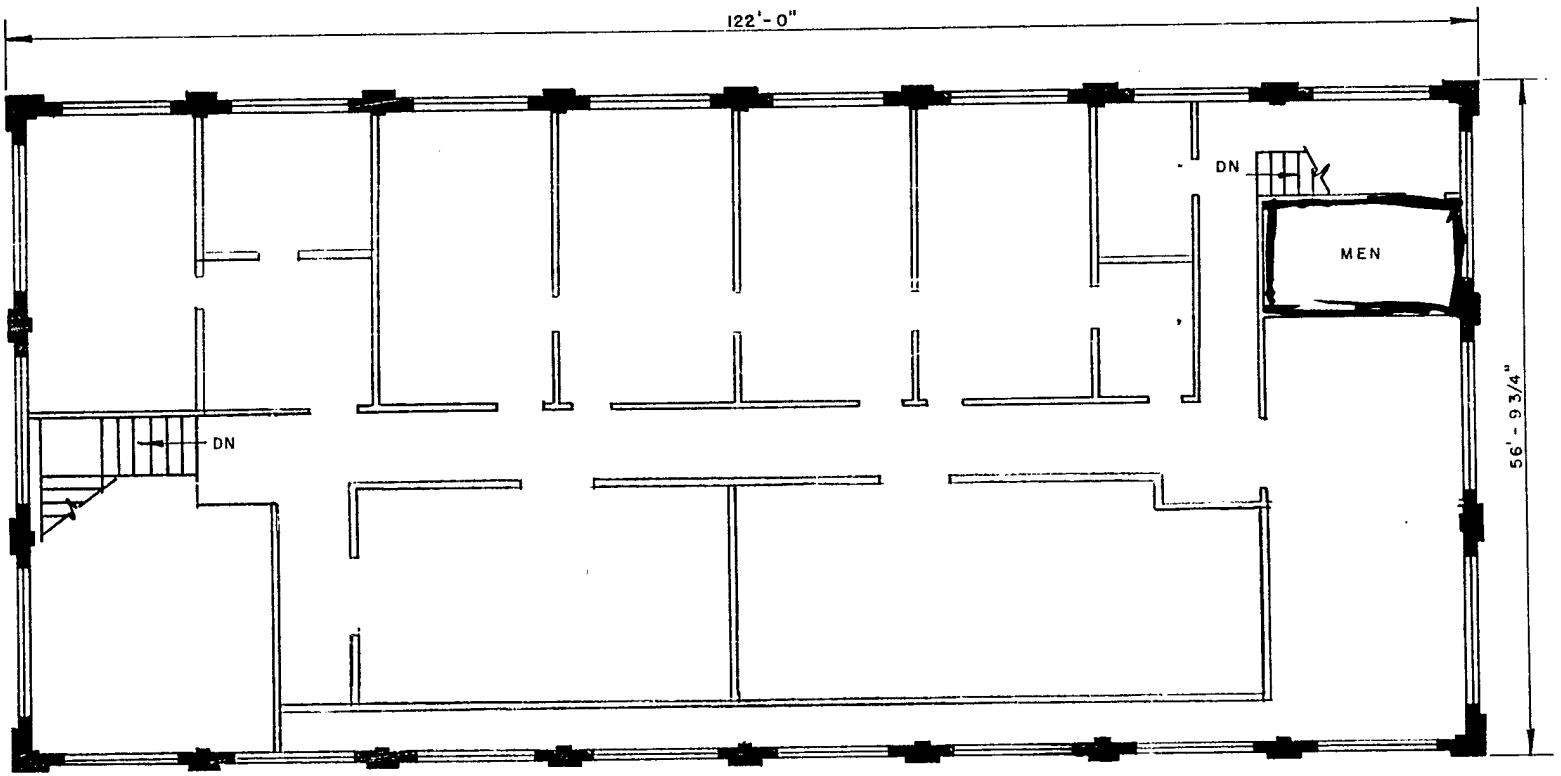
WATERVLIET ARSENAL
WATERVLIET, NY

Drawn by: J.R GANGEMI, A.E. Appd by: J.C. Kalvaitis

MAIN FLOOR PLAN
RESEARCH & ENGINEERING
LAB. BUILDING
BUILDING NO. 124

Scale: 1/16"= 1'-0" Date:

Revisions	Date



53

NET FLOOR AREA
6,900 Square feet
FLOOR CAPACITY
40 LBS Per square foot

N

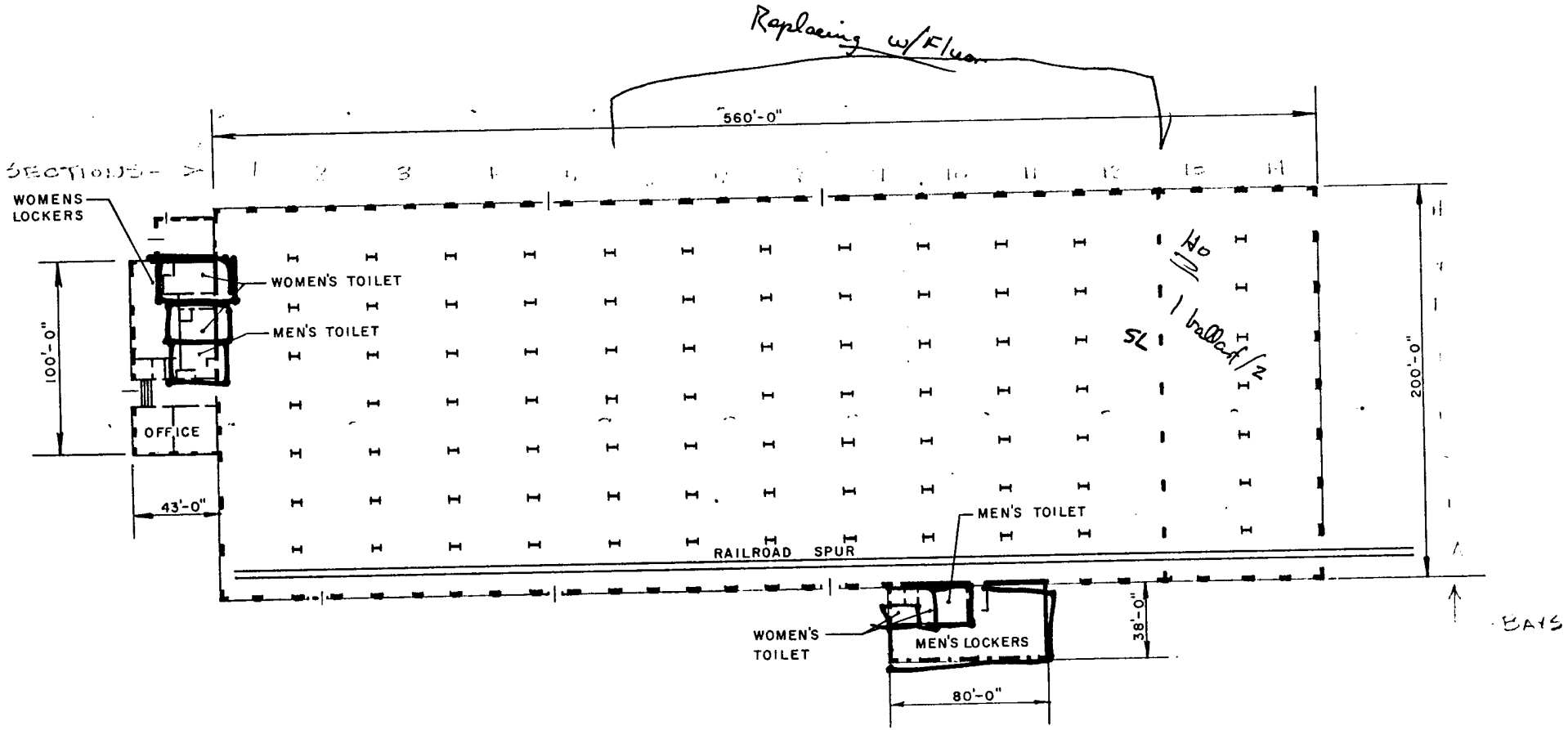
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR PLAN
RESEARCH & ENGINEERING
LAB. BUILDING
BUILDING NO. 124

Scale: 1/16" = 1'-0" Date:

Revisions	Date



54

NET FLOOR AREA
118,921
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

N

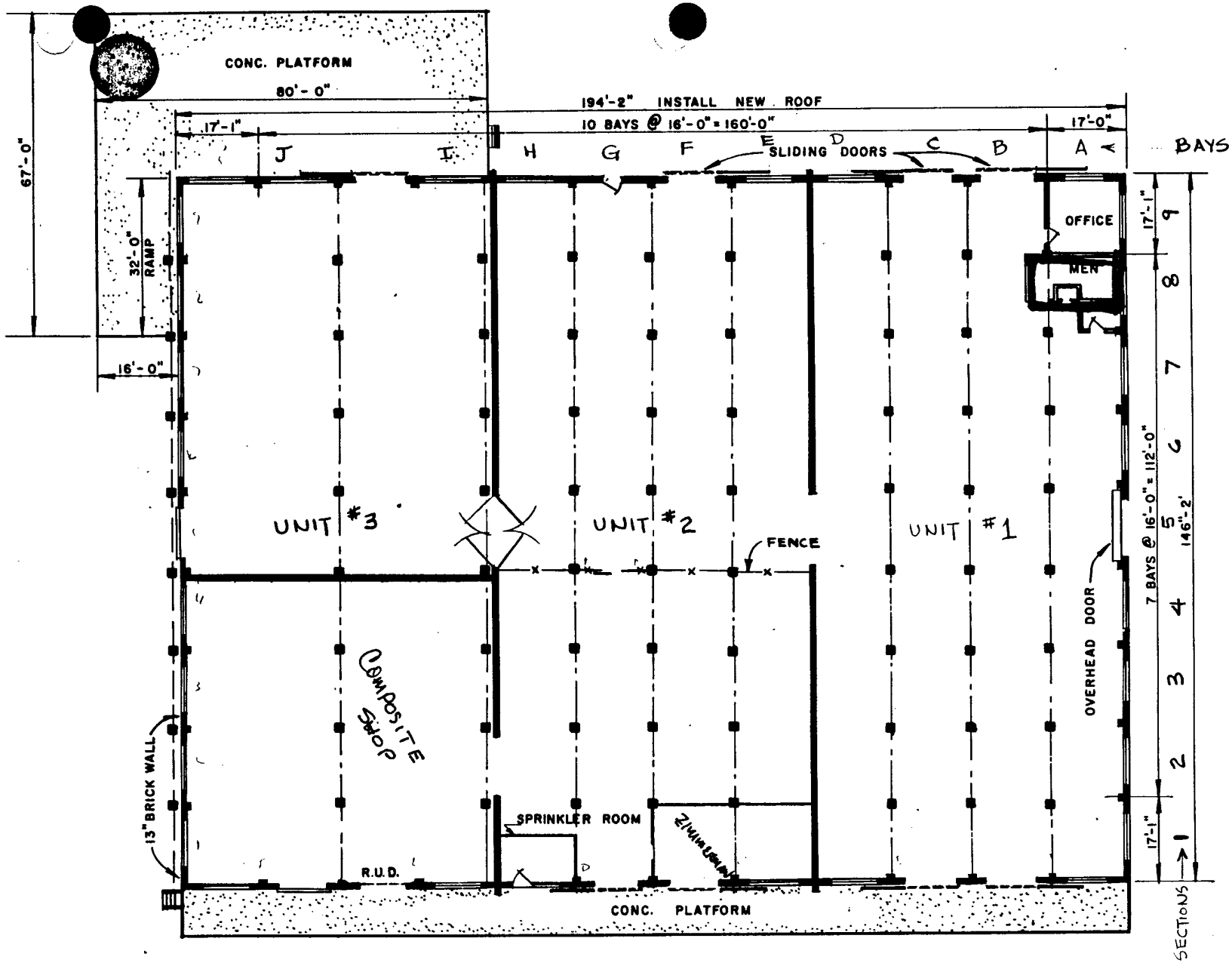
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

MAIN FLOOR
BREECH PILOT
LINE BUILDING
BUILDING NO. 125

Scale: 1" = 80'-0" Date:

Revisions	Date



55

NET FLOOR AREA
27,625
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

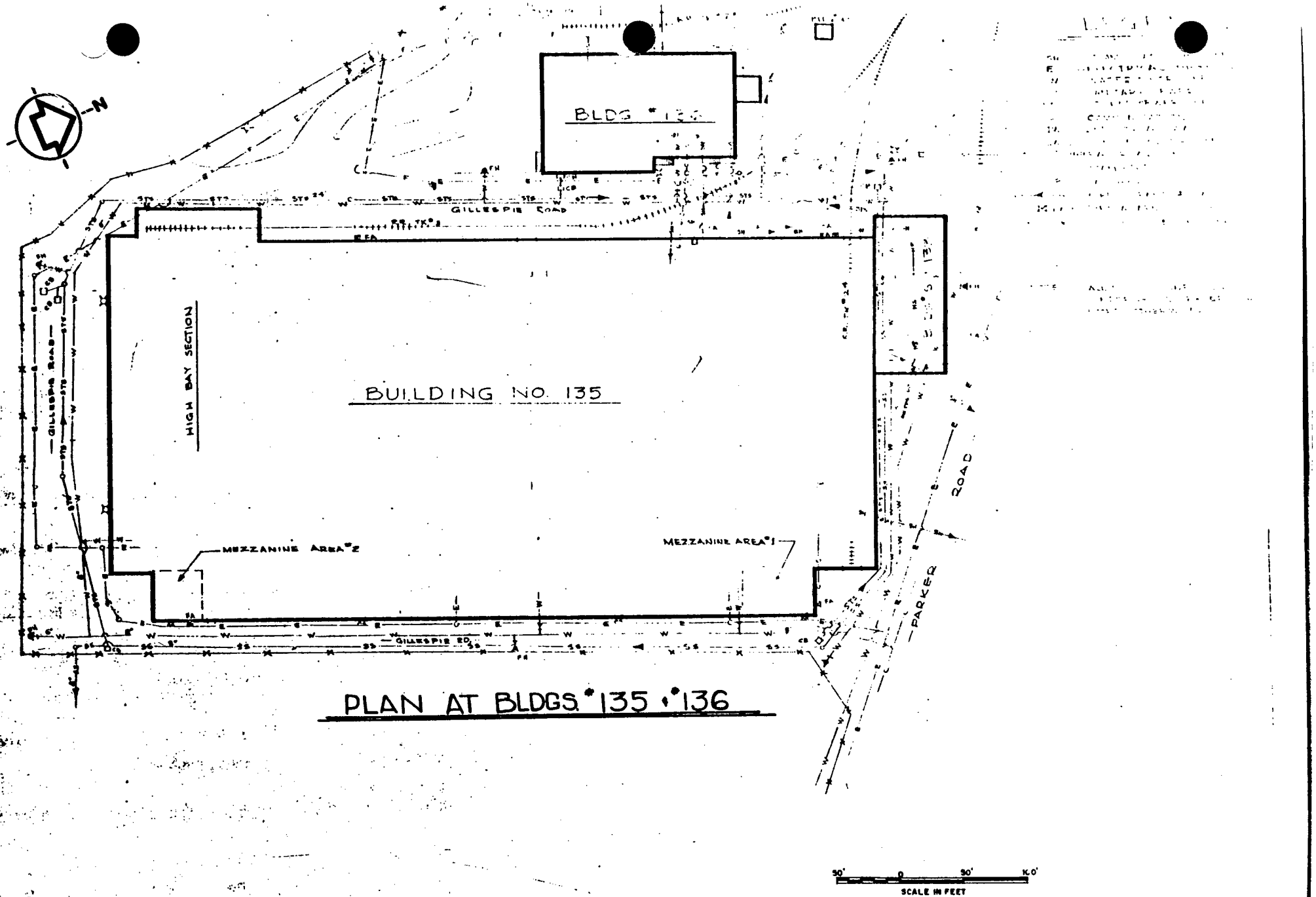
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by: J.C. Kuhlman

Revisions	Date

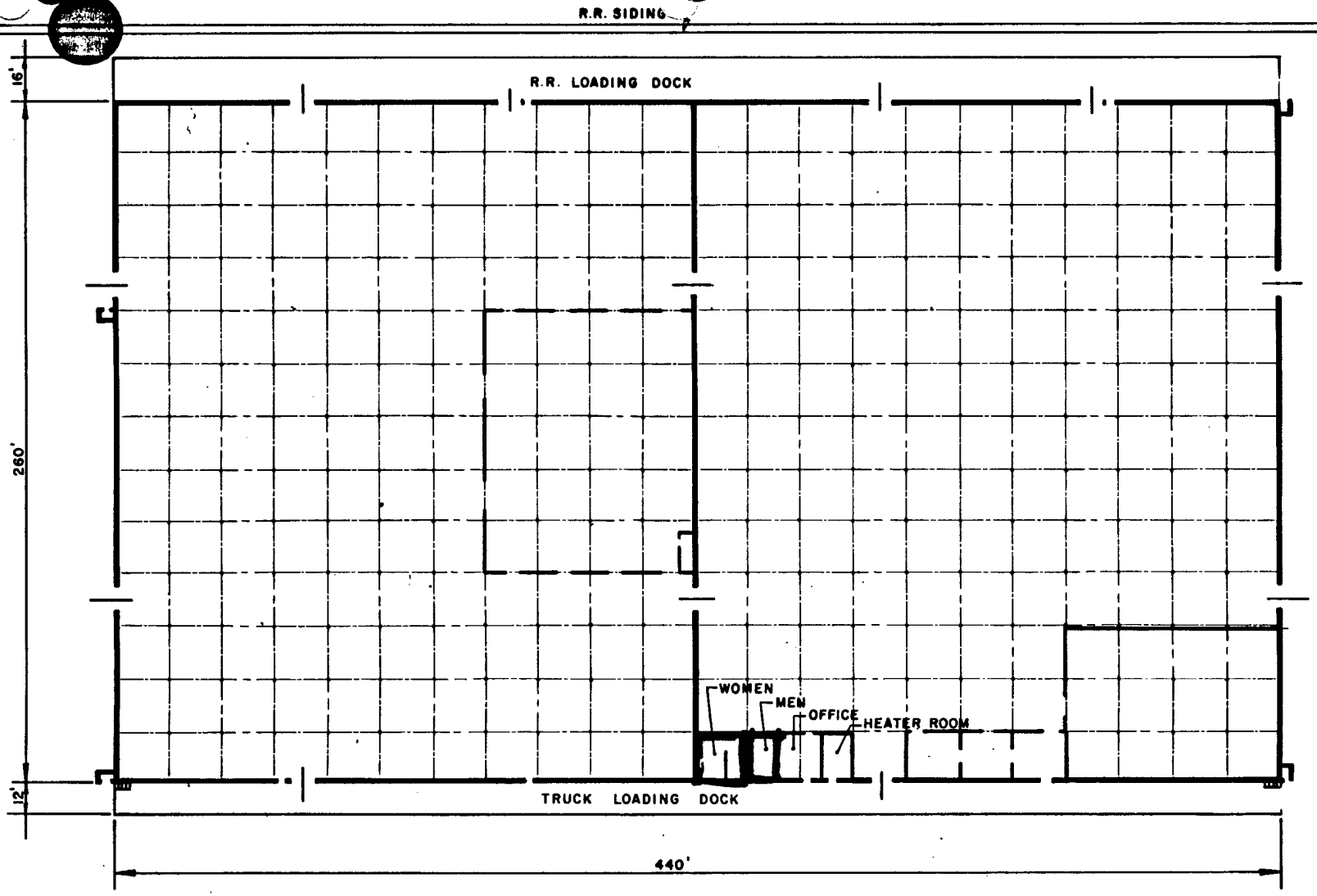
MAIN FLOOR PLAN
WEST STOREHOUSE
BUILDING NO. 130

Scale: 1" = 30'-0" Date:



PLAN AT BLDGS. #135 & #136

SUBMITTED BY:	WATERVLIET ARSENAL	WATERVLIET, NEW YORK
POST ENGINEER WATERVLIET ARSENAL DATE	DETAIL SITE PLAN – BUILDINGS NO 135 & 136	
	LINE ITEM: PR- FY 197_ MCA	
	FILE NO: -35	SHEET OF



NET FLOOR AREA
113,510
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

FLOOR PLAN
WAREHOUSE &
PROPERTY DISPOSAL
BUILDING NO. 145

Scale: 1"=60'-0" Date:

Revisions	Date

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/18/91

IDENTITY:

OPERATION Campbell Hall

Address Building #10

Type(s) of occupancy Admin - Headquarters

Name of person in charge of energy Barbara Carpenter Walt Lubudziewski

PHYSICAL DATA:

Building orientation Front faces East

No. of floors 3 + basement

Floor area, gross, square feet 67,790

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat _____ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Storms	Wooden frame with plastic
S	"	on 3rd Floor (North)
E	"	
W	"	

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh ✓ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS.

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Hot water for space heating

10-2

BUILDING OCCUPANCY AND USE:

Weekdays:	Occupied by:* _____	people from 0730	to 1600 (hours)
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Saturdays:	0	_____	_____
Sundays, holidays	0	_____	_____

Hours air conditioned: Weekdays from 0730 to 1600; Saturdays — to — Sundays, holidays from — to —

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Avg. measured temp. = 76 F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water ✓ Steam ✓ Electric resistance _____ Other hot water fr. steam converter

Heating plant:

Boiler No. Bldg. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube _____ Watertube _____ Elec. resist. _____ Electrode _____ Other _____

Fuel used _____ Standby _____

Hot water supply _____ °F, Return _____ °F

Steam pressure _____ psi

Pumps No. _____ Total HP _____

Room heating units:

Type: Baseboard ✓ Convectors _____ Fin tube _____

Ceiling or wall panels _____ Unit heaters _____ Other well insulated - T'STAT's

Cooling plant:

Chillers: No. _____ Total capacity (tons) _____

Type: Centrifugal _____ Reciprocating _____ Absorption _____

North end has A/C (Finance & Accounting)

Figure 15-14. Building Information (con't)

OPERATION ADMINISTRATION LOCATION BLDG 10 DATE 10/18/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	~~LUMENS~~ FC	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
4' F40	4		~~46~~						3rd Fl
w/ Diffusers									
F40	4	~	50						2nd Fl
F40 cw	2		40						2nd Fl
1			27						1
F96 8'	2		5						1
F40	4 (2 REMOV)		48						1
F40	1		14		52				1
F40 cw w/o refl.			61						3rd Fl
F40 cw	2		12						Mail Rm 1st Fl
F40	4	~	50						1ST Fl North End
F40 cw	2		~~28~~	31					Print Shop Darkroom
F96 8'	2								Basement
T12 cw	2		2						

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
10 -										
ADMIN	3RD FL	4	F40T12	44	176	192	8,448	11	23,232	
	3RD FL	2	F40T12	61	122	96	5,856	11	16,104	
	2ND FL	4	F40T12	50	200	192	9,600	11	26,400	
	2ND FL	2	F40T12	129	258	96	12,384	11	34,056	
	1ST FL	2	F40T12	12	24	96	1,152	11	3,168	
	1ST FL	4	F40T12	50	200	192	9,600	11	26,400	
	BASEMENT	2	F40T12	31	62	96	2,976	11	8,184	
				377	1,042		50,016		137,544	
	BASEMENT	2	F96T12	2	4	175	350	11	963	
	TOTALS			379	1,046		50,366		138,507	

SQ. FT. = 51,000
WATTS/SQ. FT. = 1.0

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 10 DATE: 10-16-91

Notes & Comments: Building Contact : Ted Kawalcek

1st and 2nd Floor (north) is air condititioned by a packaged, split system, VAV unit:

Manufactured by Carrier, September, 1987
Model # 50 BK-044---600AA
2 compressor motors, 460v, 35.8 RLA each
15hp, 21A, indoor Fan motor
Recently balanced, O.A. ~ 15 cfm/person
Operates 6am - 6pm, 5days per week
Controlled by a 24hr./7 day time clock
No return air fan
No bybass system

Hallway doors separating the conditioned (north) area from the unconditioned area (south) are left open, conditioned air is lost to the south end.

WVA is considering adding terminal reheat (electric) coils instead of the O.A. preheat coils.

J. Green suggests installing a "Parker Bypass System"

Some rooms are too warm - add more R.A. area

WATERVLIET ARSENAL CHILLER STATUS

BLD 10 ADFS 1959 HVAC Temp - Humidity
Carrier 25 Ton Dx cooling ; Stm heat
Honeywell electric control

Components replaced:
Water cooled condenser + Tower 1983
Replaced with new air cooled condenser
Compressor - Carrier 1986
Humidifier not operational - leaks

Back-up Unit - Carrier 5 Ton
"Window" Type installation - Cooling only.

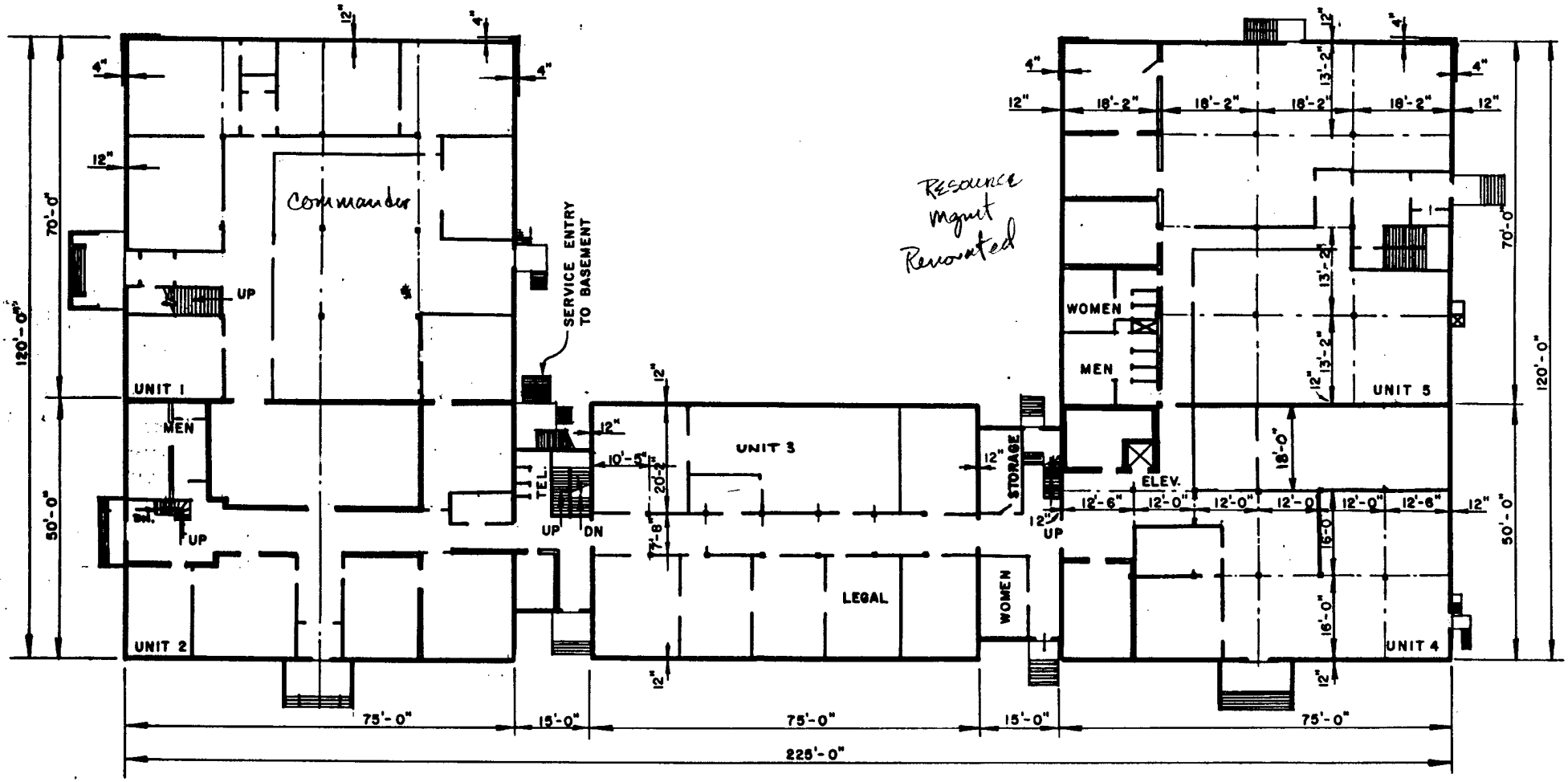
Recommend: replacement with Free-standing computer support package system similar to computer room Bld 25-3
The 4 zone setup within this area may present problems with design.
Are 4 zones necessary?
Self-contained units would eliminate need for maintaining separate steam generator for summer operation.

BLD 10-B Reproduction 1960 Cooling
YORK 5 Ton Dx cooling ; Elec control

Components original except condenser fan motor - 1986
Any major failure (compressor) would necessitate replacement of condensing unit

Comment : Sommer Cooling only

BLD 10-2 south Computer Rm. 1983 Temp, Hum.
Liebert 5 Ton Computer support system
Dx cooling ; electric heat ; humidifier pan
Microprocessor control



NET FLOOR AREA
24,495
Square feet

FLOOR CAPACITY

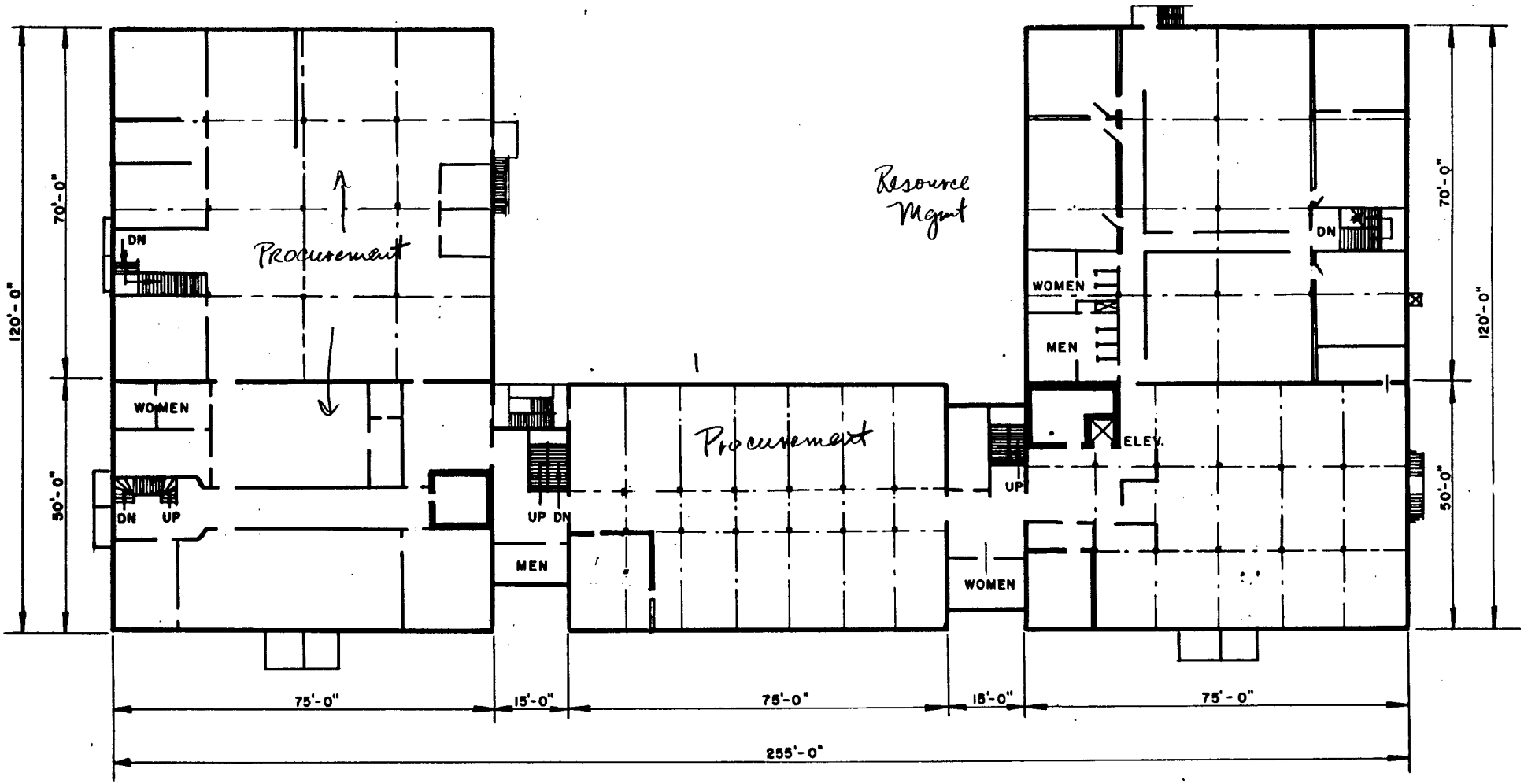
N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A... by: ...

FIRST FLOOR PLAN
CAMPBELL HALL
BUILDING NO. 10

Revisions	Date
	4/76



11-01

NET FLOOR AREA
21,495
Square feet

FLOOR CAPACITY
80 + CTR 50 LBS N 40 LBS

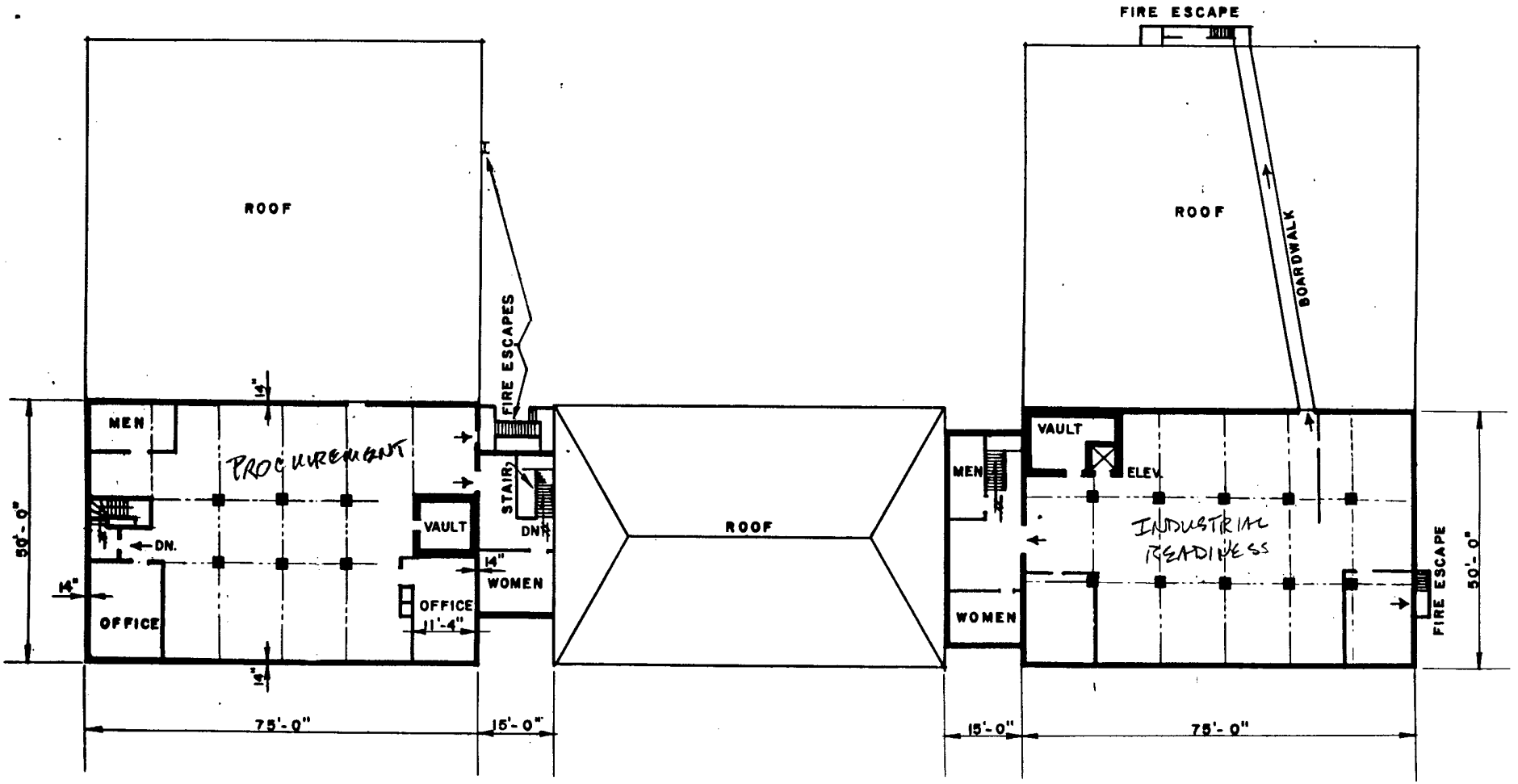
WATERVLIET ARSENAL

WAT[illegible]ET, N.Y.

Drawn by: J.R. GANGEMI, [illegible] by: DC Kaufmann

Revisions	Date
	4/76

SECOND FLOOR PLAN
CAMPBELL HALL
BUILDING NO. 10



10-12

NET FLOOR AREA
8,025
Square feet

FLOOR CAPACITY
30 LBS
Per square foot

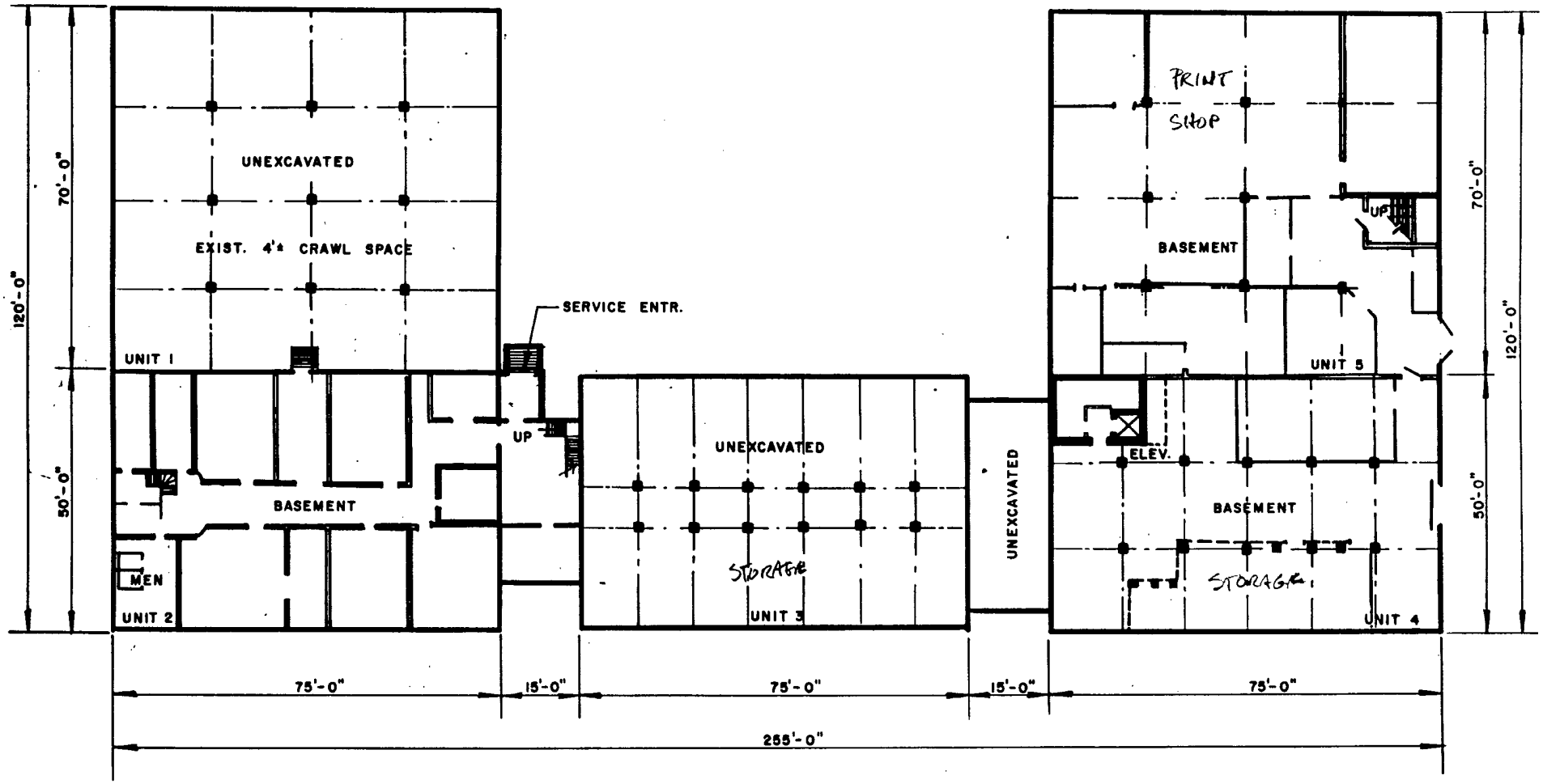
N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, [redacted] by: [redacted]

THIRD FLOOR [redacted]
CAMPBELL HALL
BUILDING NO. 10

Revisions	Date
TR	4/76



10-13

NET FLOOR AREA
11,855
Square feet

FLOOR CAPACITY
1000 LBS

N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R. [illegible] A.E. App'd by: [illegible]

Revisions
R

BASEMENT PLAN
CAMPBELL HALL
BUILDING NO. 10

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/16/91

IDENTITY:

OPERATION Garage (Motor Pool)

Address Bldg. #15 Transportation & Traffic Mgmt Div

Type(s) of occupancy Admin in front – motor pool in rear

Name of person in charge of energy Art Tonjes

PHYSICAL DATA:

Building orientation Front faces west

No. of floors 1

Floor area, gross, square feet 22,990

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat _____ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Single	
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam from B. 136

15-2

BUILDING OCCUPANCY AND USE:

Weekdays:	Occupied by:* 10	people from 0730	to 1600	(hours)
	1	1600	2400	
Saturdays:				
Sundays, holidays				

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

*(Account for 24 hours a day. If unoccupied, put in zero)

15-3

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____ °F. dB_____ mph wind Night_____ °F. dB_____ mph wind

Summer: Day_____ °F. dB_____ mph wind Night_____ °F. dB_____ mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____ °F. dB_____ %rh Night_____ °F. dB_____ %rh

Summer: Day_____ °F. dB_____ %rh Night_____ °F. dB_____ %rh

74F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam_____ Electric resistance_____ Other_____

Heating plant:

Boiler No. _____ Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors__✓__ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other_____

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

15-4

OPERATION Motor Pool LOCATION Bldg 15 DATE 10/16

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F40 diffuser	2		31						Travel Office
									4 lights of 31 in hall - occupancy sensor
F40 w/reflectors	2		[illegible]						Motor pool
			91						
F96	2		2						Breaker Box

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

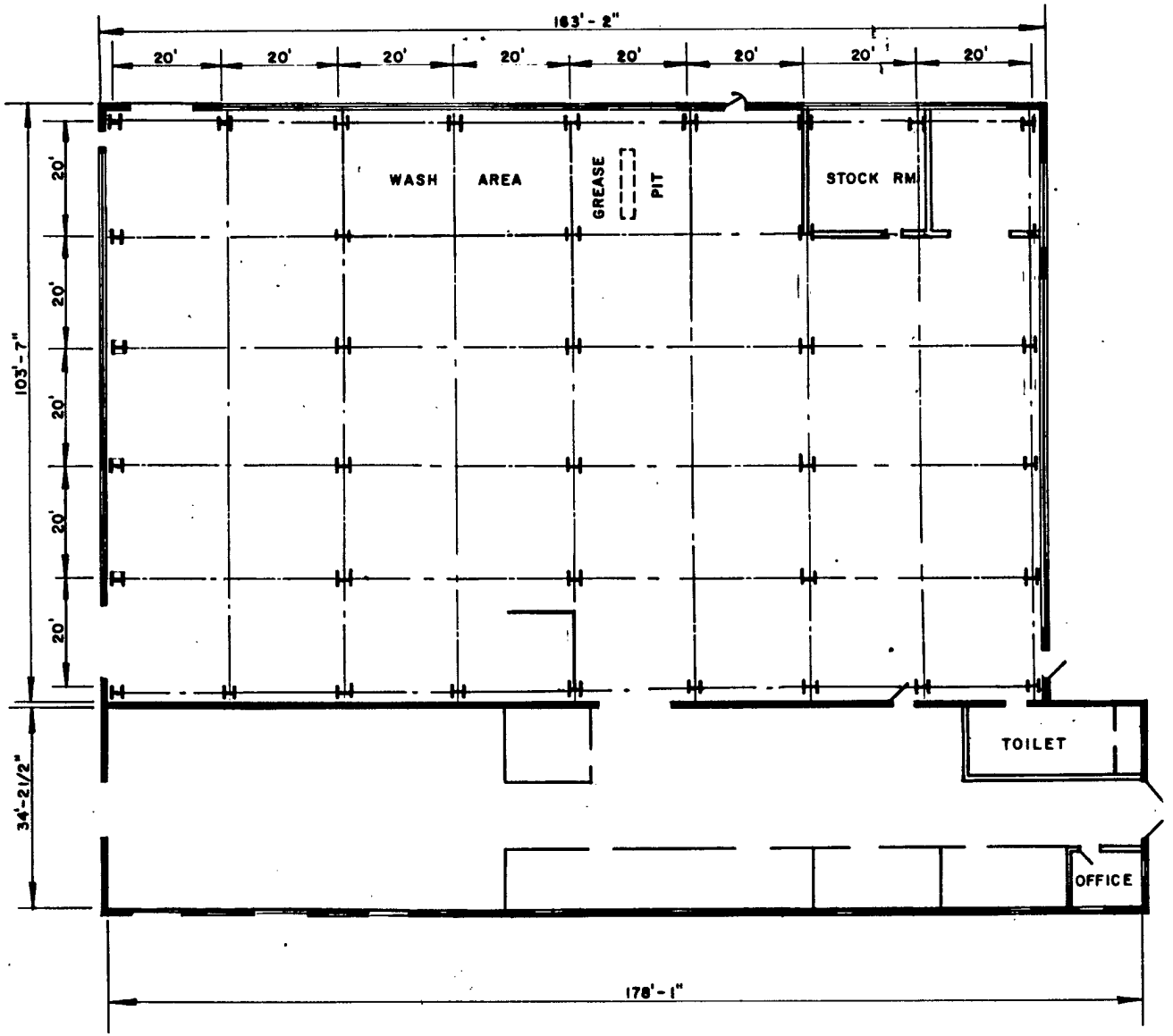
BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
15 - MOTOR POOL & TRAVEL		2	F40T12	122	244	96	11,712	11	32,208	
		2	F96T12	2	4	175	350	11	963	
	TOTALS			124	248		12,062		33,171	
			SQ. FT. =	22,865						
			WATTS/SQ. FT. =	0.5						
	MOTOR POOL		SQ. FT. =	16,000			9,086		24,987	
			WATTS/SQ. FT. =	0.6						
	TRAVEL		SQ. FT. =	6,100			2,976		8,184	
			WATTS/SQ. FT. =	0.5						

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 15 DATE: 10-17-91

Notes & Comments:

Split system with air cooled condenser and
Direct expansion cooling with R22
Manufactured by Carrier
Condenser model # 38 AF 007
fan; ½ hp, 1075 RPm, 3500 cfm, 1.5 FLA, 460V
Compressor; 12.1 RLA, 460 V, 3ø
Evaporator/fan coil unit
Model # 40 BA 009
fan; 2500-4300 cfm, 468-715 RPm
Fan motor; 1 hp, 3450 RPm



8-51

NET FLOOR AREA
22,865
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. Rec'd by:

FLOOR PLA
GARAGE (MOTOR
BUILDING NO. 15

Scale: 1" = 30'-0" Date:

Revisions	Date

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/17/91

IDENTITY:

OPERATION Major Component Building

Address Bldg 20

Type(s) of occupancy Admin / Manufacturing

Name of person in charge of energy Ron Barben / John Adamo

20-1

PHYSICAL DATA:

Building orientation Long dimension faces N-S

No. of floors 2 - Main floor + mezzanine

Floor area, gross, square feet 107,157

Net air conditioned square feet 9600

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E — W —

Figure 15-14. Building Information

Roof:

Type: Flat ✓ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N		
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None ✓ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS.

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam fed convectors w/ movable doors for control

20-2

BUILDING OCCUPANCY AND USE:

Weekdays: Occupied by:* 20 people from 0730 to 1600 (hours) Admin only

	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
	_____	_____	_____
Saturdays:	_____	_____	_____
Sundays, holidays	_____	_____	_____

Hours air conditioned: Weekdays from_____to_____; Saturdays_____to_____ Sundays, holidays from_____to_____

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

m'd 72F Complaints of uneven heating/esp. cooling.

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors ✓ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other plus HV system

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____ Rated input_____ Water Temp. 110 °F

Energy Source: Gas____, Oil____, Electric____, Other_____

Figure 15-14. Building Information (con't)

20-5

OTHER EQUIPMENT (Kitchen, etc.):

Equip. Description	Quantity	Size/Capacity in BTU, KW, HP, etc.
Snack bar on ground floor	1	

11. OPERATING SCHEDULE:

OPERATION (Start-stop)

Equipment description	Weekdays	Saturday	Sunday	Holiday
Refrigeration cycle mach.				
Fans – supply				
Fans – return/exhaust				
Fans – exhaust only				
HVAC auxilliary equip.				
Lighting – interior				
– exterior				
Fan kitchen exhaust				
Elevators				
Escalators				

OPERATION Manufacturing LOCATION Bldg 20 DATE 10/17/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F96T17	2	Floor	864						Production floor 3 shifts 24x36 36 24 144 72 864
F40	3		51	142					Office Area 7:30 - 4:00 & wall switches
F40	3		53	142					Offic Area
F40	3		10	142					Halls
F40	3		10	142					Cafeteria / locker rooms

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
20 - MANUFACTURING		3	F40T12	124	372	144	17,856	11	49,104	Offices, etc.
		2	F90T12	864	1,728	200	172,800	24	1,036,800	Manuf. Floor
	TOTALS			988	2,100		190,656		1,085,904	
			SQ. FT. =	105,290						
			WATTS/SQ. FT. =	1.8						
	MANUF FL		SQ. FT. =	86,400			172,800		1,036,800	
			WATTS/SQ. FT. =	2.0						
	OFFICES		SQ. FT. =	9,600			17,856		49,104	
			WATTS/SQ. FT. =	1.9						

BUILDING DATA NOTES - WATERVLIET ARSENAL

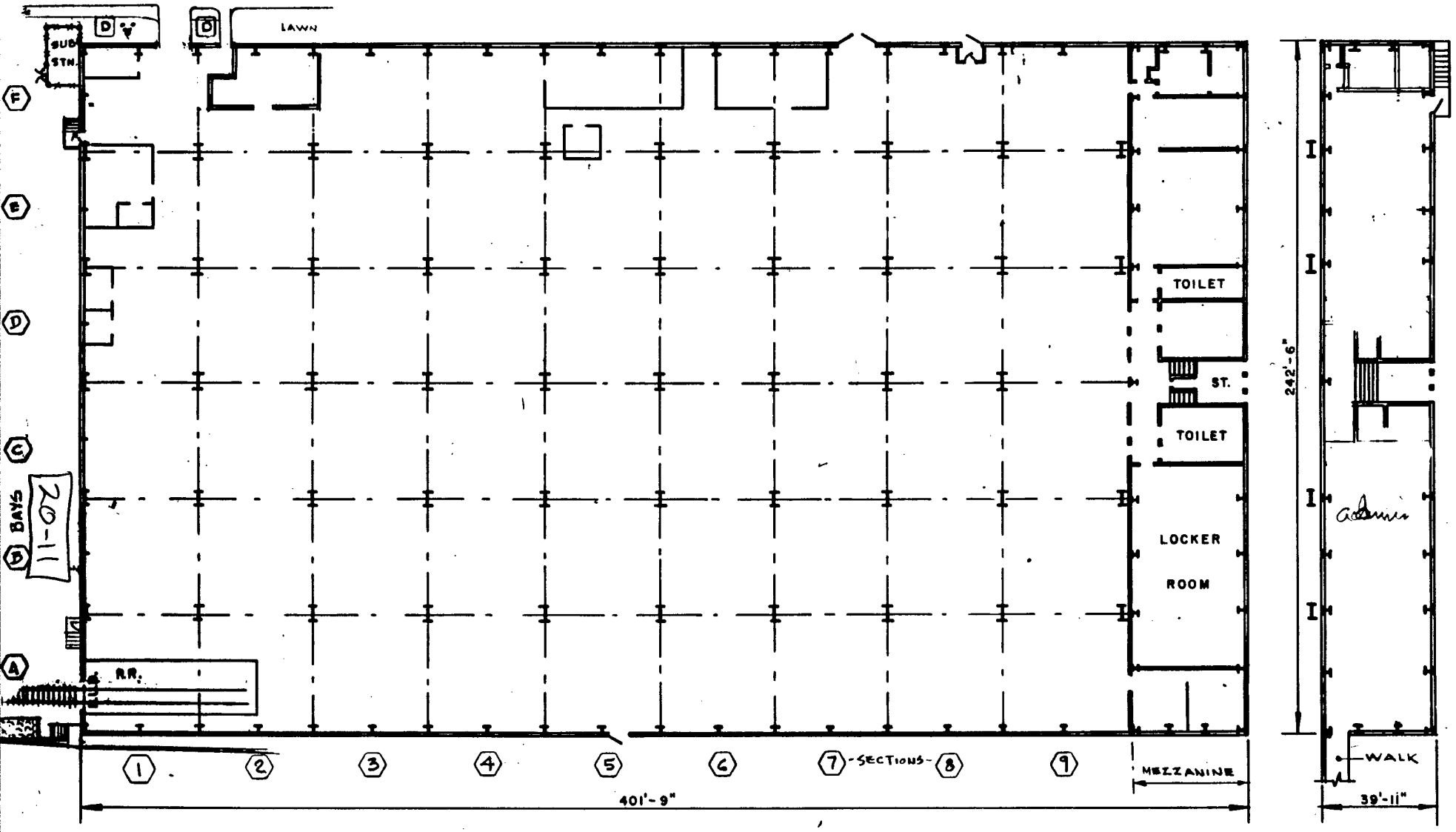
SURVEY BY: Todd / Green Bldg. # 20 DATE: 10-17-91

Notes & Comments:

Rooftop package unit
Manufactured by Trane
Air cooled condenser

BLD. 20 Mezzanine 1985 Temp control
Carrier VVT - Variable volume/temp system
30 Ton
Control - computerized electronic

Comment: Heat system completely separate from VVT. Consists of wall radiation with Honeywell electric control.



FIRST FLOOR

MEZZANINE

NET FLOOR AREA
105290
Square feet

FLOOR CAPACITY
1000 LBS - 100 LBS
Per square foot

N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A. [redacted] by: [redacted]

FIRST FLOOR
MEZZANINE
BUILDING NO. 20

Revisions	Date

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/17/91

IDENTITY:

OPERATION O'Keefe Hall

Address Bldg 21

Type(s) of occupancy Cafeteria and Admin

Name of person in charge of energy Ed Van Kampen

PHYSICAL DATA:

Building orientation Front faces East

No. of floors 1

Floor area, gross, square feet 17,121

Net air conditioned square feet

Construction type:

Walls (masonry curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

21-1

Figure 15-14. Building Information

Roof:

Type: Flat _____ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Storm Windows	
S		
E	Single	
W	Storms	

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric Elec Hot Water

Gas total energy _____

Oil total energy _____

Other Steam space heat - not on 10/17/91

21-2

BUILDING OCCUPANCY AND USE:

	Occupied by:*	people from	to	(hours)
Weekdays:	1	0300	0500	
	2	0500	0600	
	5	0600	0730	
	19	0730	1330	
	17	1330	1430	
	2	1430	1630	
Saturdays:				
Sundays, holidays	2	1630	0300	

Hours air conditioned: Weekdays from — to —; Saturdays — to — Sundays, holidays from — to —

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

w'd 74°F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. B. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors_____ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other Radiators - Steam

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____Wall switches_____

Control switching_____

Exterior Lighting: Type_____Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____Rated input_____Water Temp. 80 °F

Energy Source: Gas_____, Oil_____, Electric_____, Other_____

Figure 15-14. Building Information (con't)

21-5

OTHER EQUIPMENT (Kitchen, etc.):

Equip. Description	Quantity	Size/Capacity in BTU, KW, HP, etc.
Elec. Grill		
N. Gas Ovens		
N. Gas Stoves		
Ice Machine		

11. OPERATING SCHEDULE:

OPERATION (Start-stop)

Equipment description	Weekdays	Saturday	Sunday	Holiday
Refrigeration cycle mach.				
Fans – supply				
Fans – return/exhaust				
Fans – exhaust only				
HVAC auxilliary equip.				
Lighting – interior				
– exterior				
Fan kitchen exhaust				
Elevators				
Escalators				

OPERATION Cafeteria / ACS LOCATION Bldg 21 DATE 10-17-91

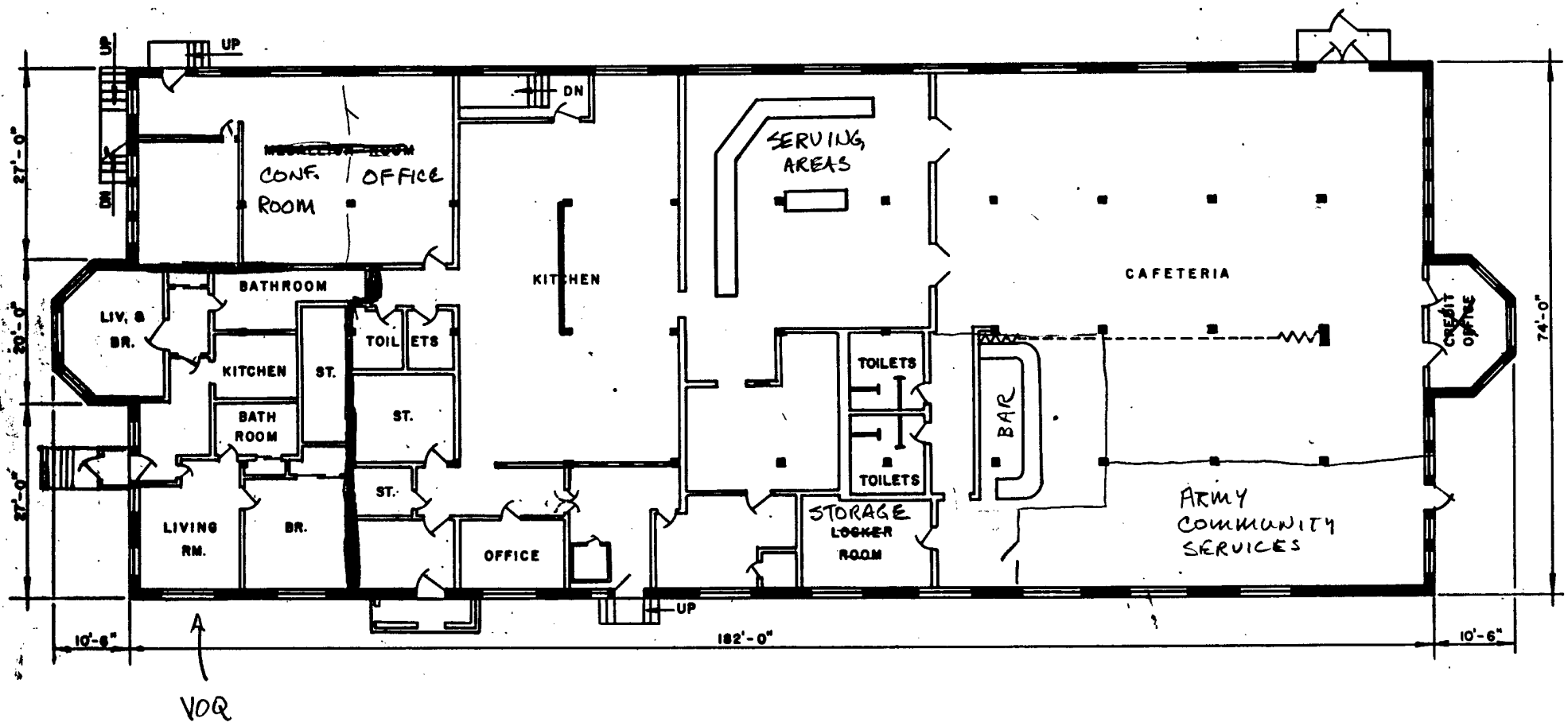
MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F40	2	Cafeteria	36						
F40	2	Kitchen	14						
F40	2	Bar	2						
F40	2		18						ACS

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
21 - CAFETERIA		2	F40T12	62	124	96	5,952	11	16,368	
	TOTALS			62	124		5,952		16,368	

SQ. FT. = 13,580
WATTS/SQ. FT. = 0.4



NET FLOOR AREA
14,990
Square feet

FLOOR CAPACITY
1000 - 1000 - 300 LBS

N

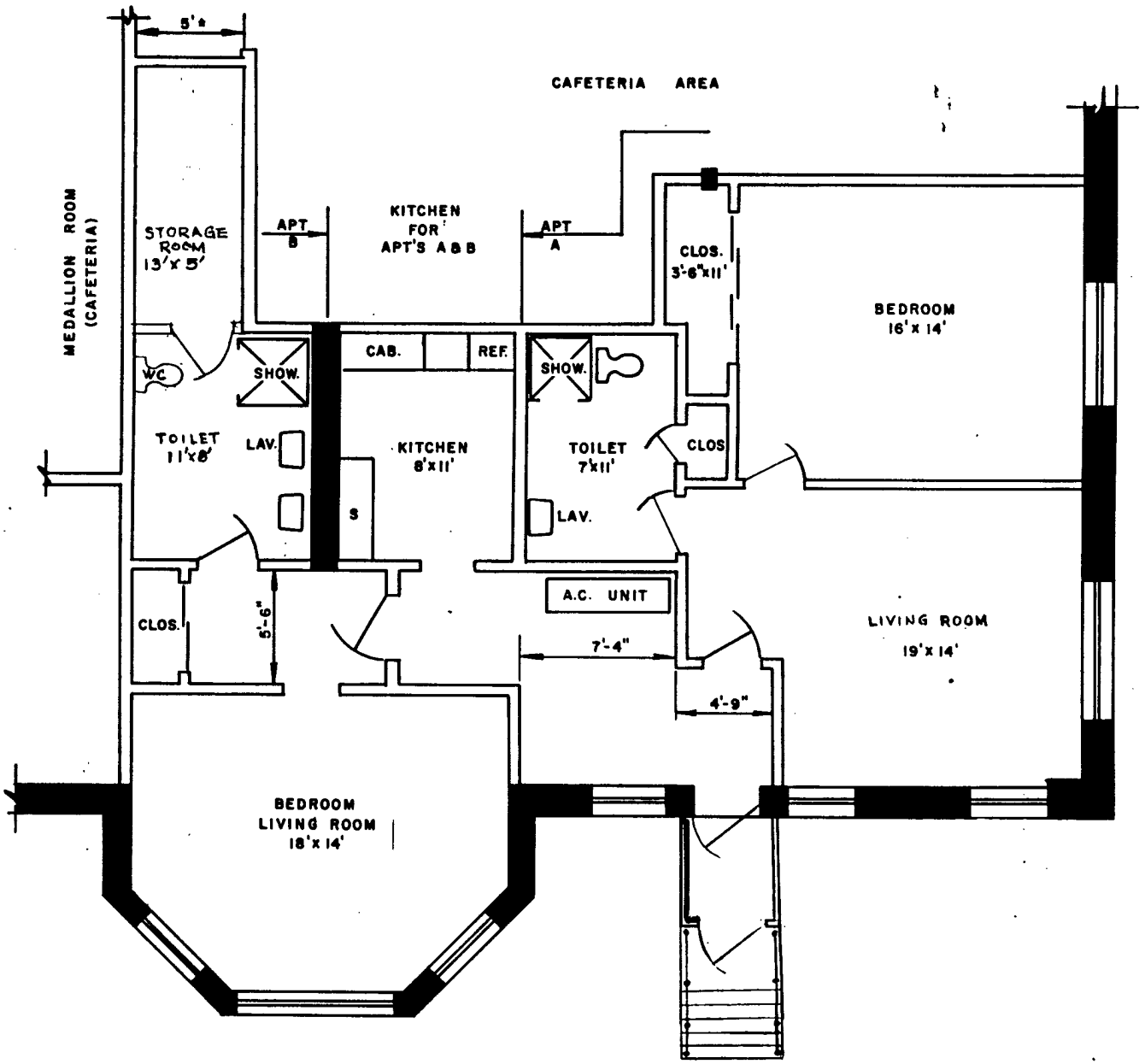
WATERVLIET ARSENAL

WA[illegible]IET, N.Y.

Drawn by: J.R.GANGEMI[illegible] Approved by: [signature]

MAIN FLOOR [illegible]
CAFETERIA & VISITING
OFFICERS QUARTERS

Revisions	Date
	3/72



21-10

NET FLOOR AREA
Square feet
FLOOR CAPACITY
Per square foot
11'-0" ± CLG. HT.

WATERVLIET ARSENAL

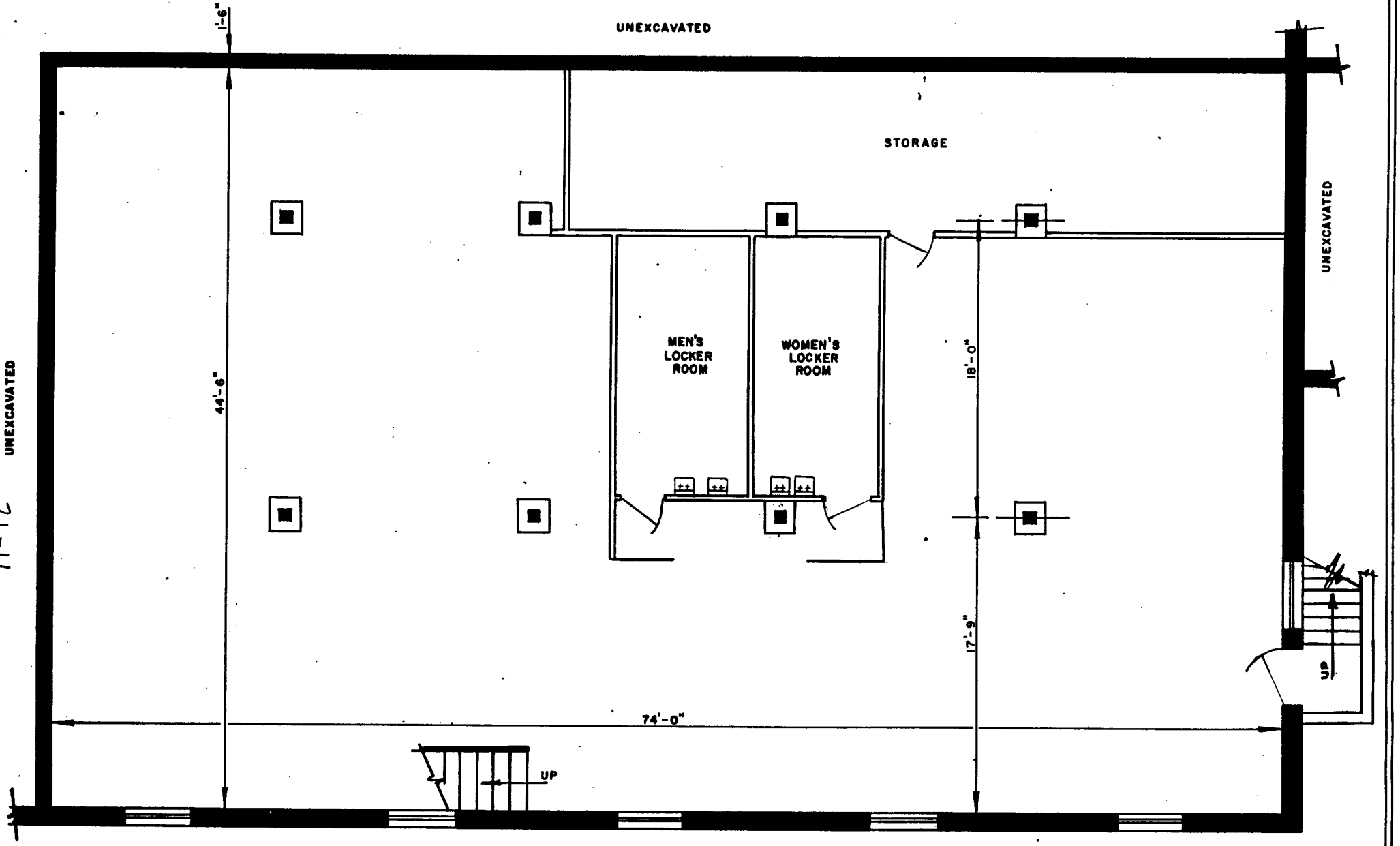
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. Rec'd by:

FIRST FLOOR
UPH
BUILDING NO. 21

Revisions	Date
	3/72

Scale: 1/8"x1'-0" Date:



11-11

NET FLOOR AREA
Square feet
FLOOR CAPACITY

N

WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A[illegible] by: [illegible]

BASEMENT FLOOR PLAN
CAFETERIA & VISITING OFFICERS QUARTERS

Revisions	Date
	3/72

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/17/91

IDENTITY:

OPERATION Fire Station

Address Bldg 22

Type(s) of occupancy Fire Station

Name of person in charge of energy Don Strait

PHYSICAL DATA:

Building orientation Front faces East

No. of floors 1

Floor area, gross, square feet 9955

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

22-1

Roof:

Type: Flat _____ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Storms	
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS.

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam radiators - most off - some TSTAT's

- Could use exhaust hoses for vehicles during maintenance checks. Engines run 15 min ea. morning (4)
- Currently entire room is exhausted.

BUILDING OCCUPANCY AND USE:

Weekdays: Occupied by:* 5 people from 0006 to 22/00 (hours)

Saturdays:

Sundays, holidays

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

Summer: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

Summer: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

m'd 70-76°

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam_____ Electric resistance_____ Other_____

Heating plant:

Boiler No. _____ Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors_____✓_____ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other_____

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Ron Gore - Haz Mat for City of Jax

Condenser water used for heating _____

Demand limiters _____

Energy storage _____

Heat recovery wheels _____

Enthalpy control of supply-return-exhaust damper _____

Recuperators _____

Others _____

LIGHTING:

Interior lighting type: _____

Watts/ft^2: Hallway/corridor _____

Work stations _____

Circulation areas within work space _____

On-off from breaker panel _____ Wall switches _____

Control switching _____

Exterior Lighting: Type _____ Total KW _____

DOMESTIC HOT WATER HEATING:

Size 2 - 80 gal Rated input _____ Water Temp. 140 & 150 °F

Energy Source: Gas ____, Oil ____, Electric ✓, Other _____

HW lines uninsulated

Figure 15-14. Building Information (con't)

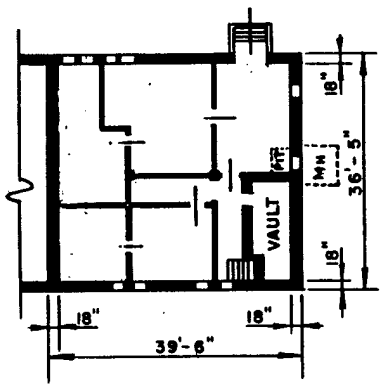
OPERATION Fire Dept LOCATION Bldg 22 DATE 10/17/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F-4	2								Lights off, no projects

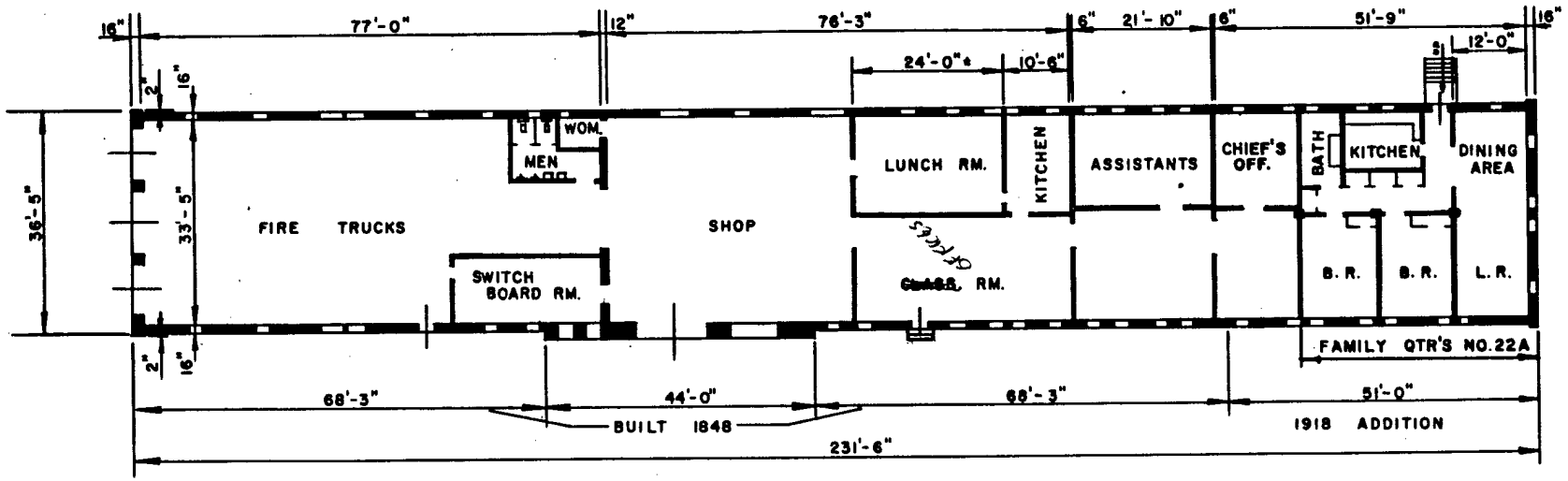
Figure 15-16. Energy Survey - Lights

22-7

7'-0" CLG. HT.



BASEMENT



FIRST FLOOR

NET FLOOR AREA
18,959
Square Feet

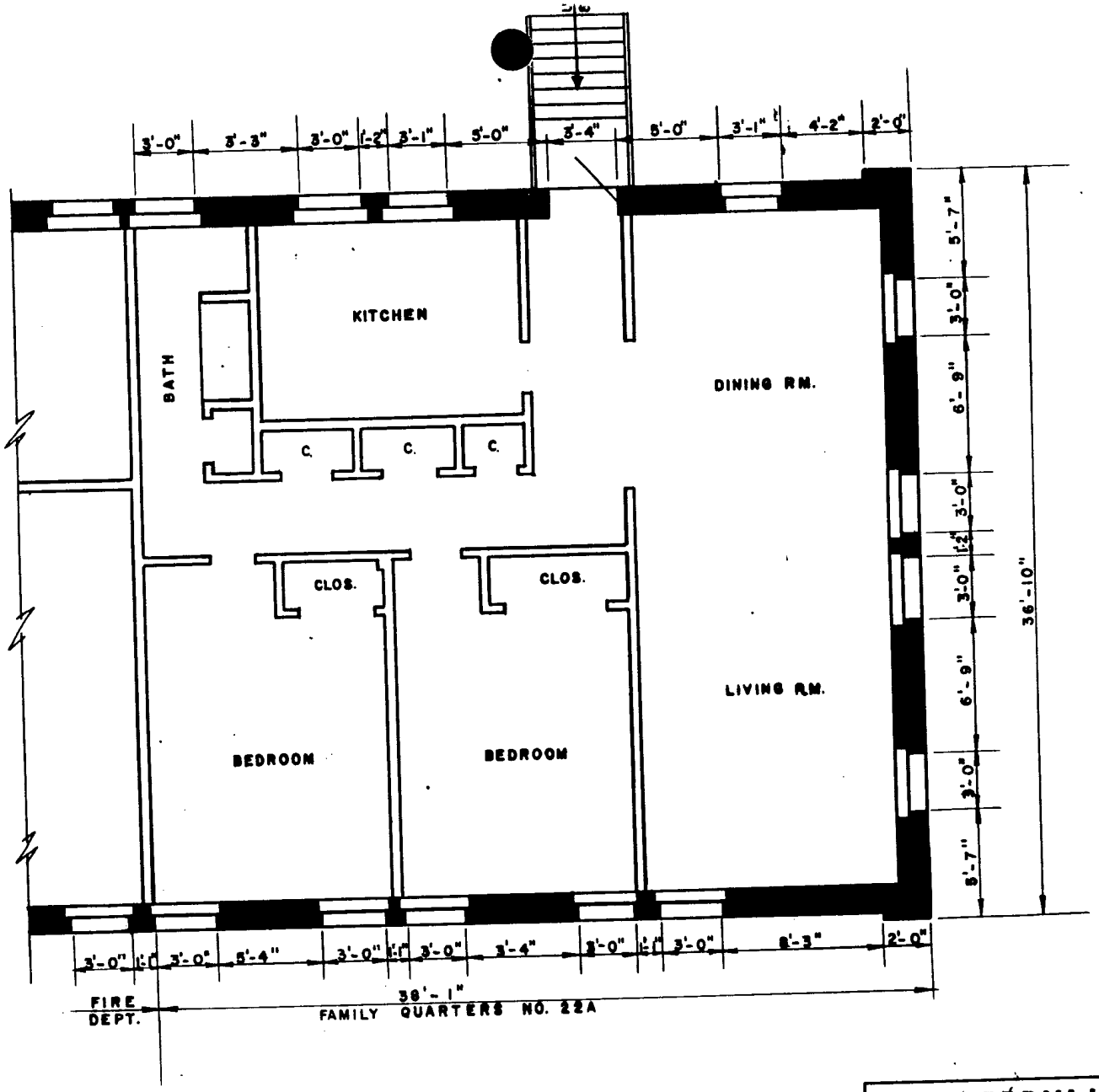
FLOOR CAPACITY

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEM[illegible] Approved by: [signature]

Revisions	Date

1ST. FL. & BASEMENT PLANS
FIRE STATION
BUILDING NO. 22



22-8

NET FLOOR AREA
1,214
(Square feet)

(FLOOR CAPACITY)

Per square feet
13'-0" + CLG HT

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R GANGEMI, A.E. Approved by:

Revisions	Date

FIRST FLOOR PLAN
FIRE STATION
BUILDING NO. 22

Scale: 1/8"=1'-0" Date:

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/17/91

IDENTITY:

OPERATION Operations Office

Address Bldg 23

Type(s) of occupancy Basement - Supply / 1st Manuf. / 2nd Office Supply / 3rd / Manuf.

Name of person in charge of energy Don Kriedler

PHYSICAL DATA:

Building orientation Front faces East attached to B. 35

No. of floors 3 plus basement

Floor area, gross, square feet 21,527

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

23-1

Figure 15-14. Building Information

Roof:

Type: Flat ✓ Pitched _____ **Color:** Light _____ Dark _____

Glazing:

Exposure	B	*Type	1ST	%Glass/Exterior wall area
N	–	Single	Dbl	–
S	–			–
E	–			50% 1st
W	–			50% 1st

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam 2nd FL has A/C

3rd FL - man. valve radiators Kevin Galuski

23-2

BUILDING OCCUPANCY AND USE:

	Occupied by:*	people from	to	(hours)	
Weekdays:	2	0730	1600	8	avail. all shifts
	1	~~0730~~	2400	1	
	1	0730	1600	2	
	1	0730	1600	3	
Saturdays:					
Sundays, holidays					

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

***(Account for 24 hours a day. If unoccupied, put in zero)**

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

Summer: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

Summer: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

m'd 78F 2 DD
78F 3
70F 1
76F B

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam_____ Electric resistance_____ Other_____

Heating plant:

Boiler No. _____ Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____°F, Return_____°F

Steam pressure_____psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors___✓___ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other_____

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

OPERATION Manuf & Supply LOCATION Bldg 23 DATE 10/17

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
Phillips F96T12 Slimline 8'	2		25	170(?)					Office Supply Floor 2
Phillips F96T12CW 8'	2		19						Floor 3
F40	3		48						1st Floor Manuf (2 shift operation)
Philips F40/CW	2		34						Basement Supply
F96T12 CW 8'	2		1						

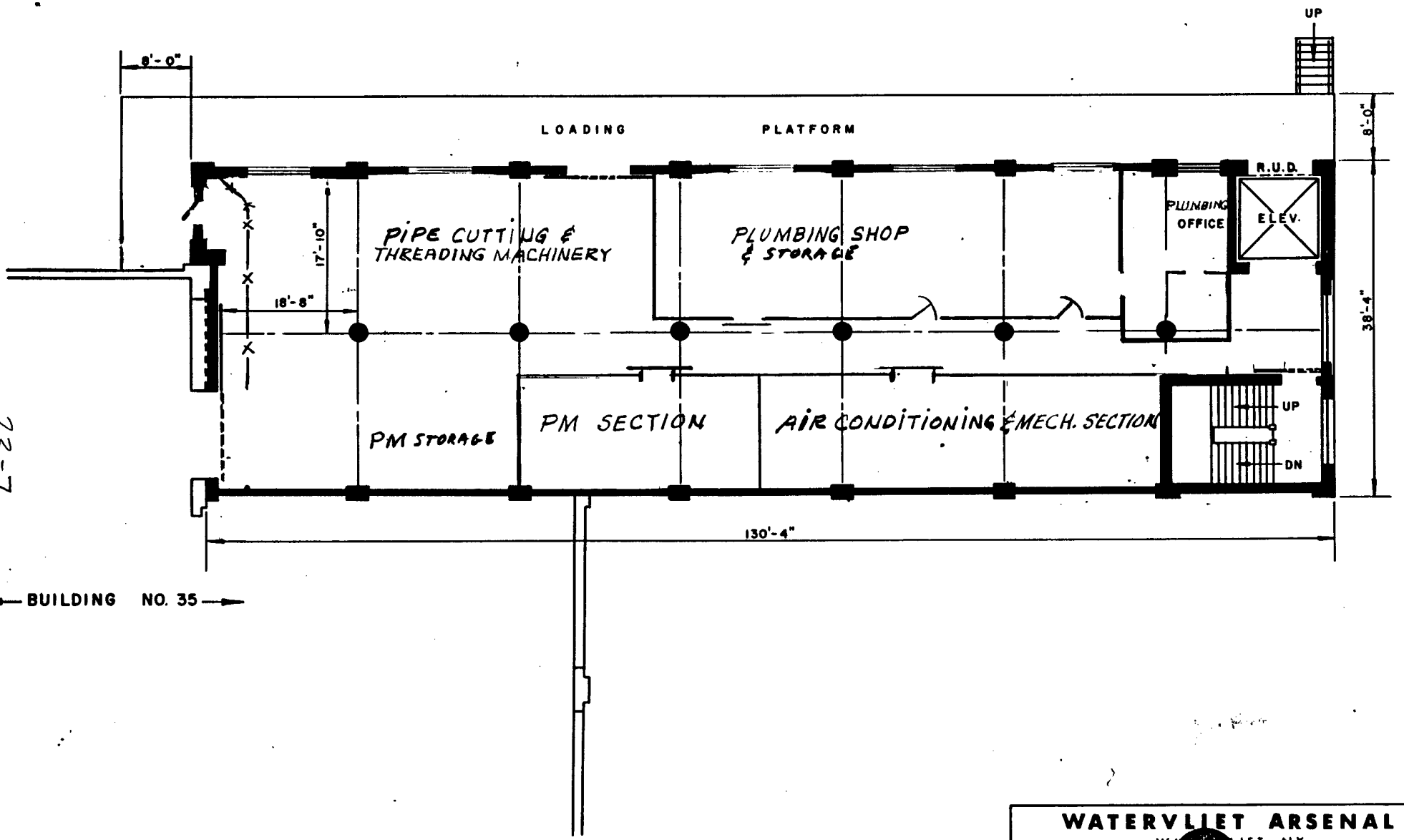
23-5

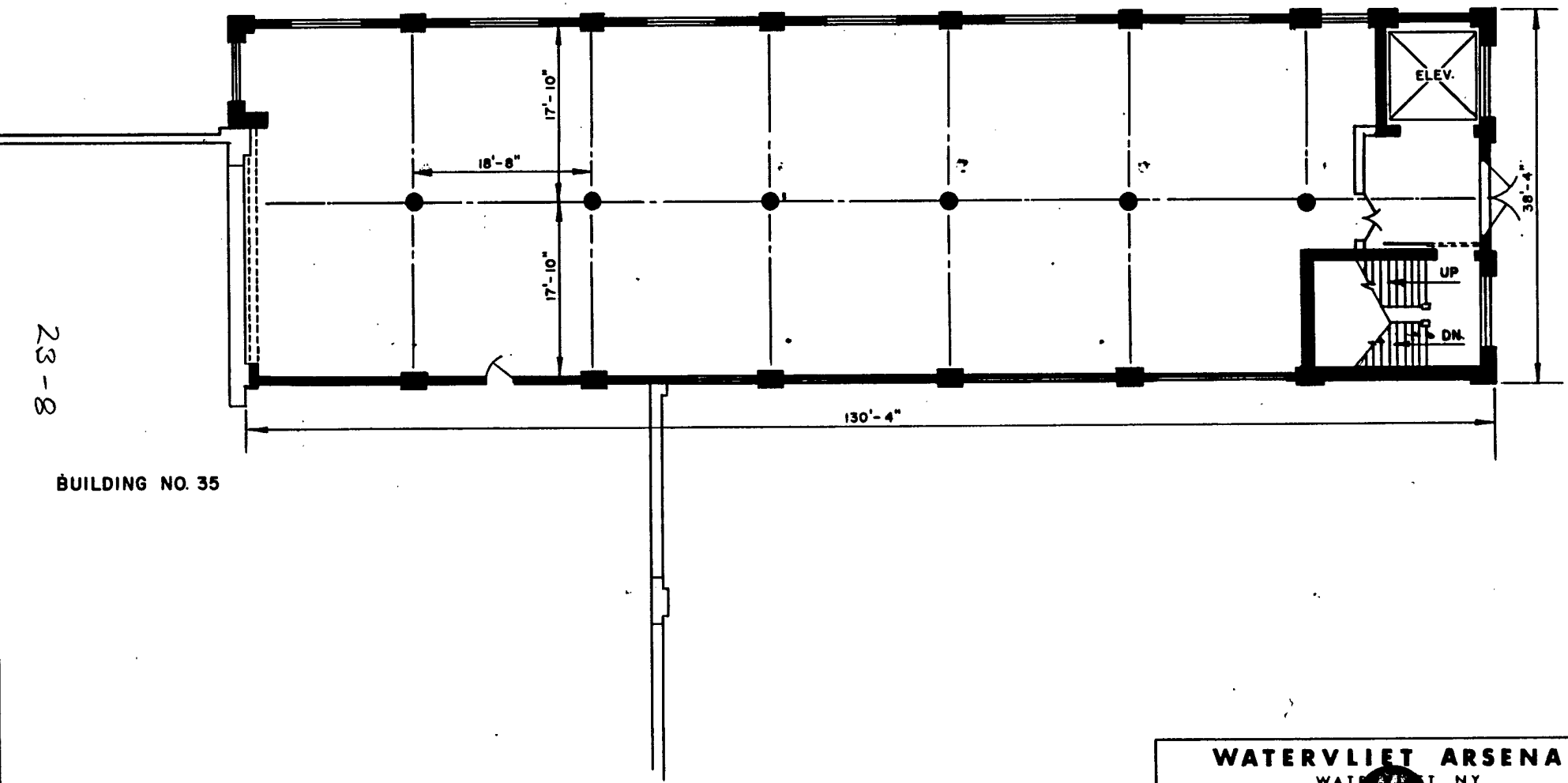
Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
23 -										
MANUF & SUPPLY	2ND FL	2	F96T12	25	50	175	4,375	11	12,031	
	3RD FL	2	F96T12	20	40	175	3,500	11	9,625	
				45	90		7,875		21,656	
	1ST FL	3	F40T12	48	144	144	6,912	17	29,376	
	BASEMENT	2	F40T12	34	68	96	3,264	11	8,976	
				82	212		10,176		38,352	
	TOTALS			127	302		18,051		60,008	

SQ. FT. = 19,600
WATTS/SQ. FT. = 0.9


UP
8'-0"
LOADING
PLATFORM
8'-0"
R.U.D.
PLUMBING
OFFICE
ELEV.
17'-10"
PIPE CUTTING &
THREADING MACHINERY
PLUMBING SHOP
& STORAGE
18'-8"
38'-4"
PM STORAGE
PM SECTION
AIR CONDITIONING & MECH. SECTION
UP
DN
130'-4"
BUILDING NO. 35
23-7
NET FLOOR AREA
8,410
Square feet
FLOOR CAPACITY
N
WATERVLIET ARSENAL
WATERVLIET, N.Y.
Drawn by: J.R.GANGEM
Revisions
Date
FIRST FLOOR
TOOL PROCESSING
BUILDING #23



23-8

BUILDING NO. 35

NET FLOOR AREA
5,410
Square feet

FLOOR CAPACITY

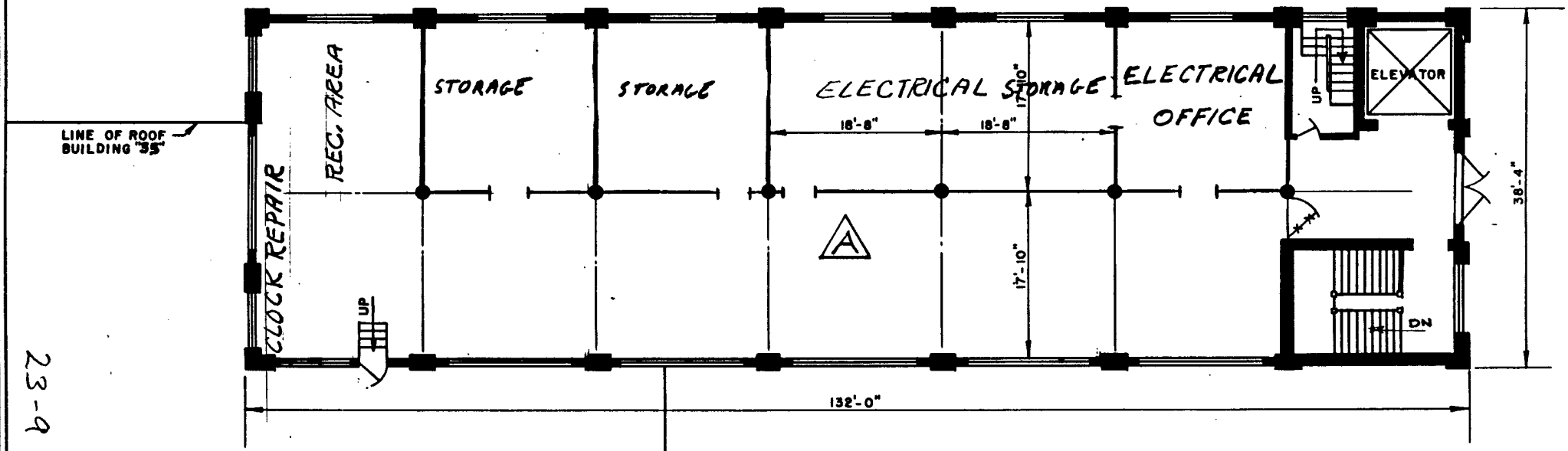
N

WATERVLIET ARSENAL
WAT[illegible]T, N.Y.

Drawn by: J.R.GANGEMI, A[illegible] by: [signature]

SECOND FLOOR [illegible]
TOOL PROCESSING
BUILDING

Revisions	Date



23-9

BUILDING NO. 35

LINE OF ROOF BUILDING "35"

NET FLOOR AREA
5,410
Square feet

FLOOR CAPACITY

N

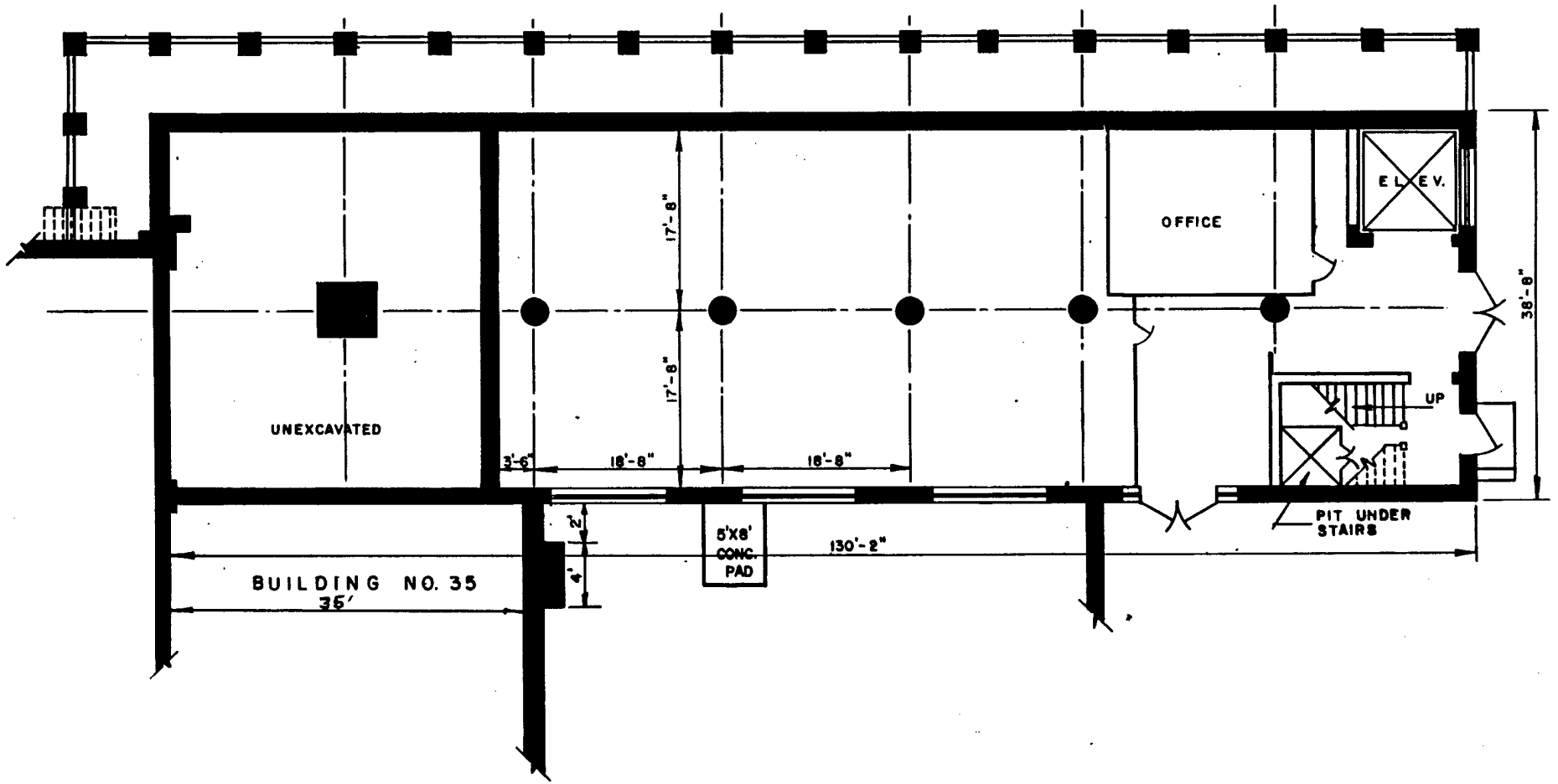
WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI Approved by:

THIRD FLOOR PLAN
TOOL PROCESSING
BUILDING NO 23

Revisions	Date
A GENERAL	9-78 T.F.N



23-10

NET FLOOR AREA
3,370
Square feet

FLOOR CAPACITY

N

WATERVLIET ARSENAL

WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, by:

BASEMENT FLOOR PLAN OF
TOOL PROCESSING
BUILDING #23

Revisions	Date

Surveyed by: P. Hutchins

Survey Date: 10/17/91

1. **GENERAL INFORMATION**

IDENTITY:

OPERATION Operations Office

Address Bldg 24

Type(s) of occupancy Admin.

Name of person in charge of energy Don Marcello

24-1

PHYSICAL DATA:

Building orientation Front faces East

No. of floors 2 + basement

Floor area, gross, square feet 11,876

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat _____ Color: Light _____

Pitched ✓ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Single	
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam

24-2

BUILDING OCCUPANCY AND USE:

Weekdays:	Occupied by:* 25	people from 0730	to 1600	(hours)
	2	->	2100	Janitor
Saturdays:				
Sundays, holidays				

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

***(Account for 24 hours a day. If unoccupied, put in zero)**

24-3

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

Summer: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

Summer: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

M'd

°F	FLOOR
74	1
72/78	2

North end is overheated

Figure 15-14. Building Information (con't)

Radiator valve leaking - 2ND Fl hallway & 1ST Fl. hallway

Source of heating energy:

Hot water_____ Steam_____ Electric resistance_____ Other_____

Heating plant:

Boiler No. _____ Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors ✓ Fin tube_____ TSTAT's

Ceiling or wall panels_____ Unit heaters_____ Other_____

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____ A/C on 2ND Floor

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____Wall switches_____

Control switching_____

Exterior Lighting: Type_____Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____Rated input_____Water Temp. 80 °F

Energy Source: Gas____, Oil____, Electric ✓, Other_____

Figure 15-14. Building Information (con't)

24-5

OPERATION Operations Office LOCATION Bldg 24 DATE 10/17/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS FC	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
			12		48				U-Tube fixtures
			12		↓				3 tubes/fixture } 2 fl
			18						↓
			18						
GE F40 Rapid	2		8						3rd Fl
Start CW	2		21						"
	2		24						"
	2		4						

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
24 - OPERATIONS		2	F40T12	57	114	96	5,472	11	15,048	
	TOTALS			57	114		5,472		15,048	
			SQ. FT. =	4,434						
			WATTS/SQ. FT. =	1.2						

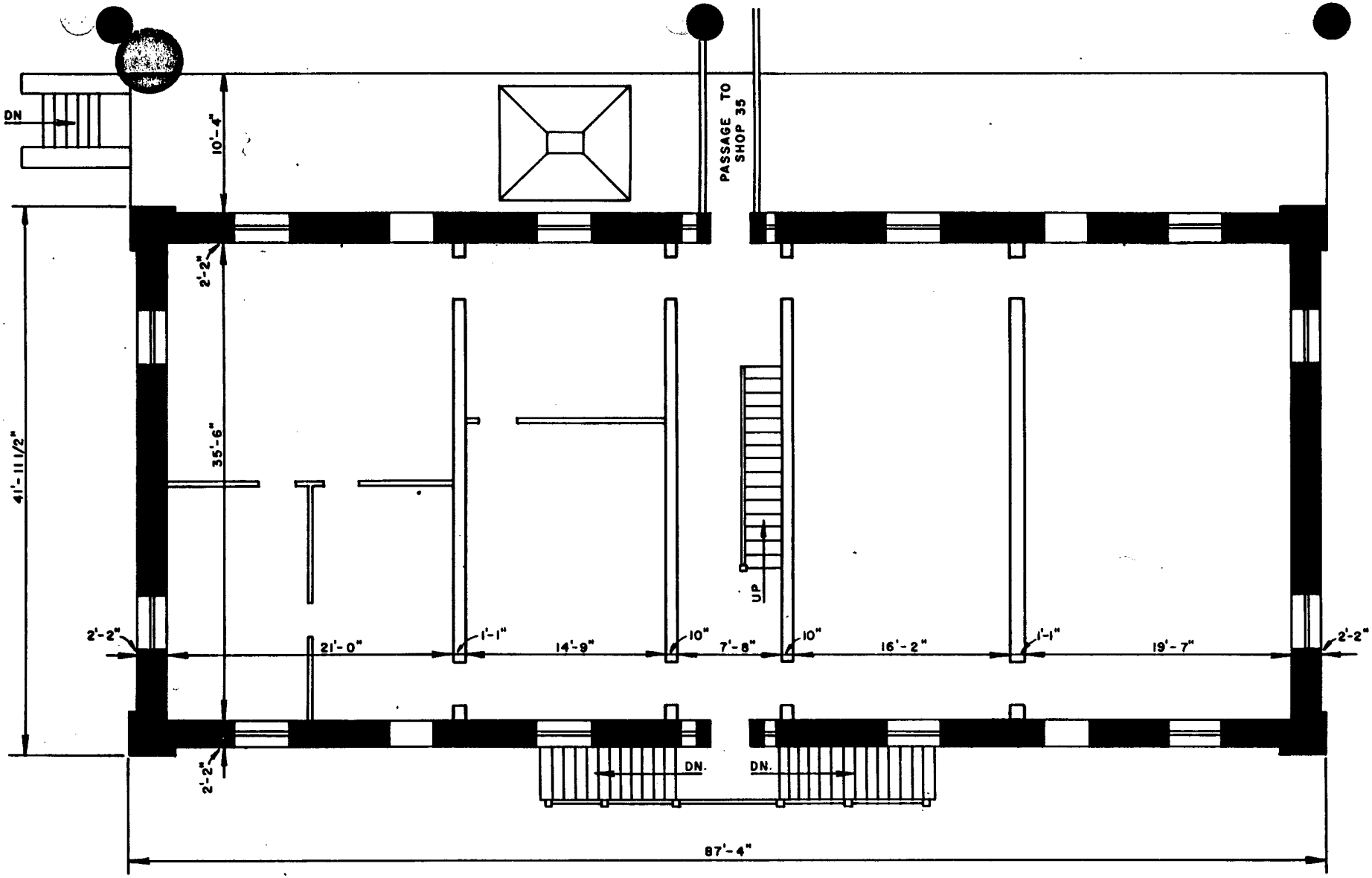
BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 24 DATE: 10-17-91

Notes & Comments:

2 Indoor single package cooling units
Serves the 2nd Floor
Manufactured by Carrier
Roomtop model # 50 AH 060 500
Supply air = 2000 cfm
220 v, 3 ϕ, 7.7 kw
3/4 hp fan motor
1.5 hp condenser motor
60,000 Btuh cooling, EER = 7.8
Entering Air Temp. = 95°F db, 67°F wb
Gross cooling capacity = 62,800 Btuh
Economizer cycle
Electric controls

LD 24 :2 EM OFFICES 1985 Temp contra
Carrier Indoor RoomTop - Two Units 5 Ton ea
ConTrol - electric



24-10

NET FLOOR AREA
4,434
Square feet

FLOOR CAPACITY
Per square foot

N

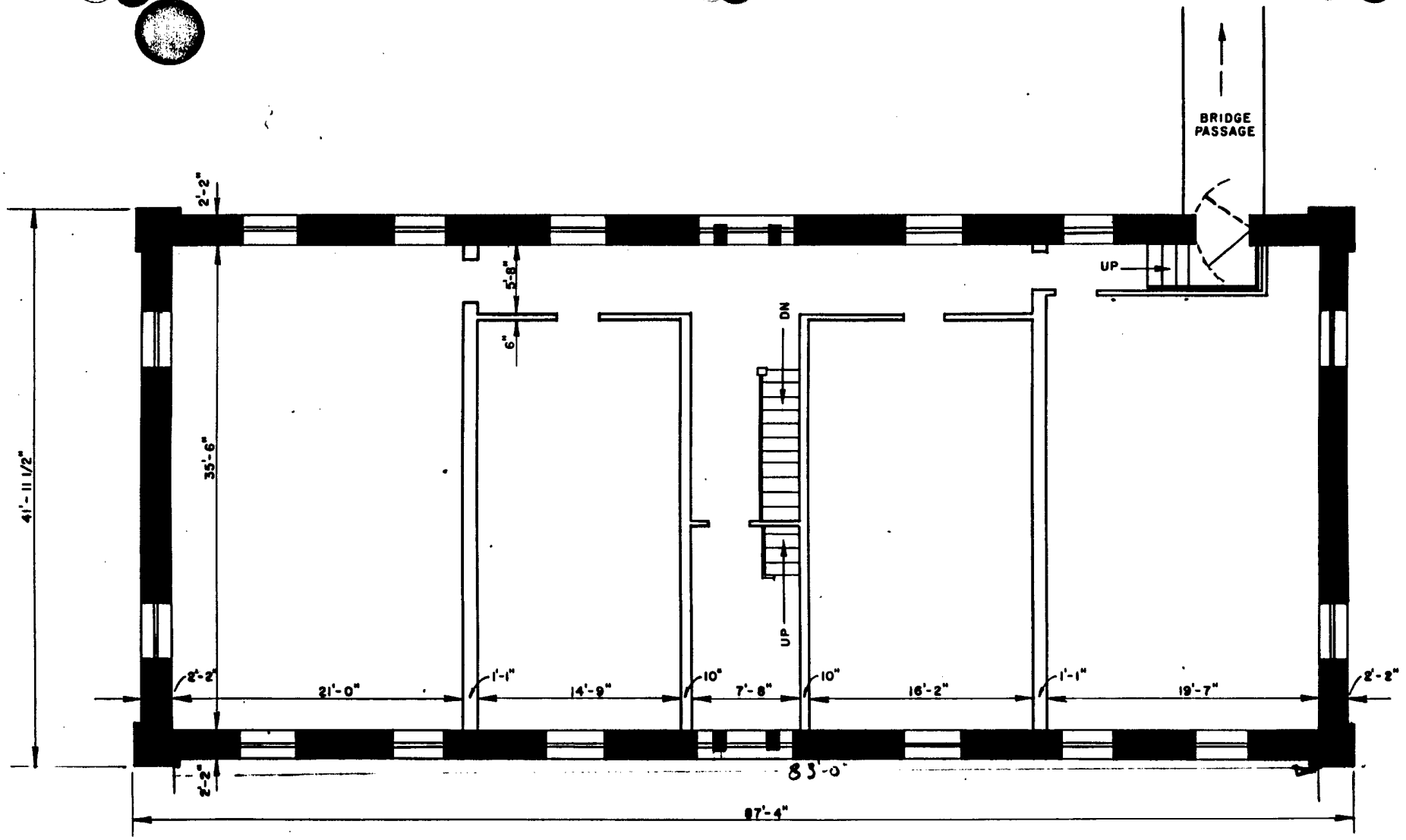
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

FIRST FLOOR PLAN
METHODS & QUALITY
CONTROL BUILDING
BUILDING NO. 24

Scale: 3/32"=1'-0" Date:

Revisions	Date



24-11

NET FLOOR AREA
4,434
Square feet

FLOOR CAPACITY
Per square foot

N

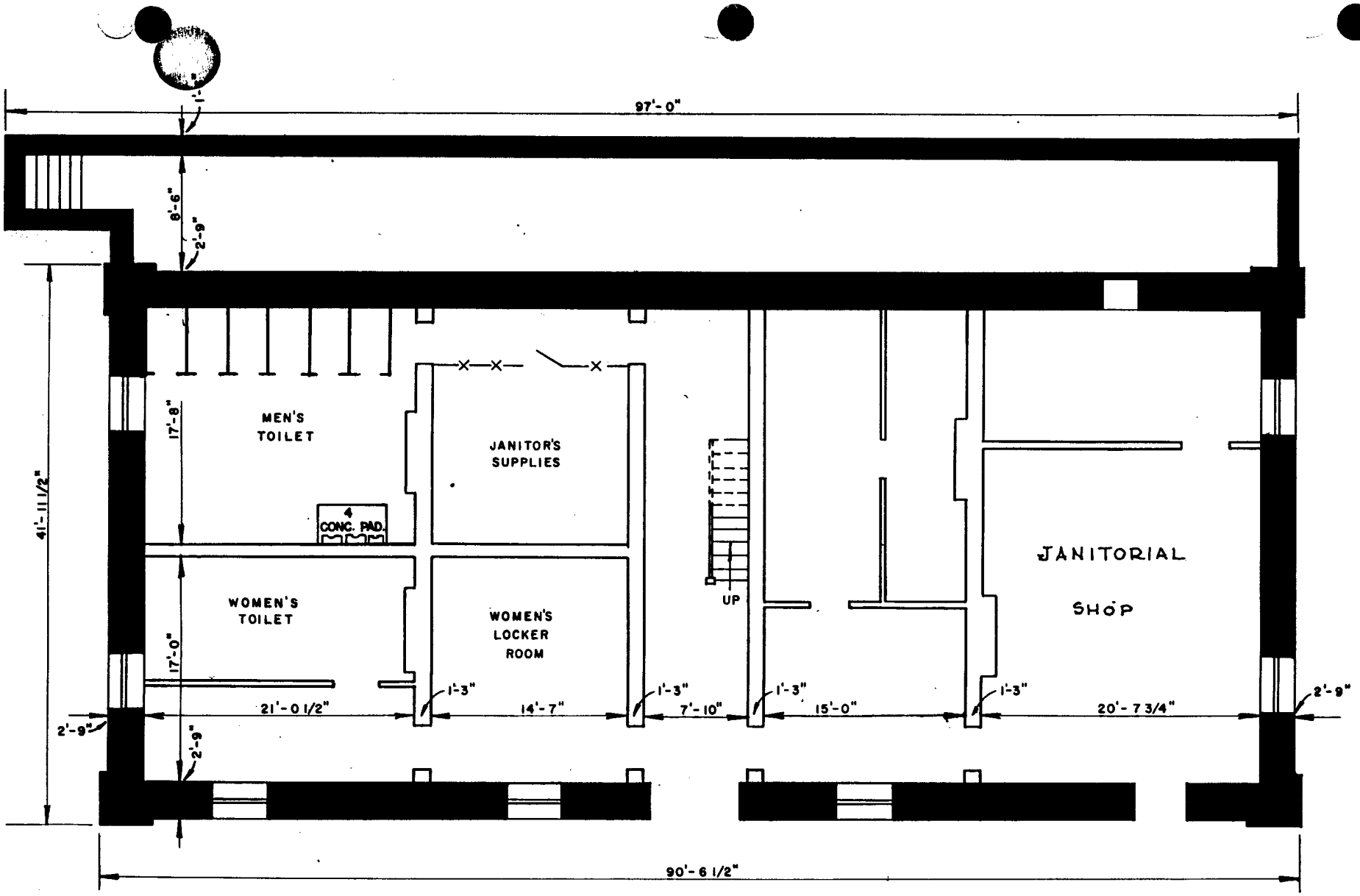
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR PLAN
METHODS & QUALITY
CONTROL BUILDING
BUILDING NO. 24

Scale: 3/32" = 1'-0" Date:

Revisions	Date



24-12

NET FLOOR AREA
4,212
Square feet

FLOOR CAPACITY
1,000 LBS
Per square foot

N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

BASEMENT FLOOR PLAN
METHODS & QUALITY
CONTROL BUILDING
BUILDING NO. 24

Scale: 3/32"=1'-0" Date:

Revisions	Date

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/17/91

IDENTITY:

OPERATION Minor Comp. Bldg & Op. Offices

Address Bldg. 25

Type(s) of occupancy Cedarin / Manufacturing

Name of person in charge of energy Timpy Oppal

25-1

PHYSICAL DATA:

Building orientation Front faces East

No. of floors 3 1 & 2 are manufacturing 3rd - Admin.

Floor area, gross, square feet 185,886

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat ✓ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Double	
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None ✓ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam heating

25-2

BUILDING OCCUPANCY AND USE:

Weekdays:	**Occupied by:***	32	**people from**	0730	**to** 1600 **(hours)** Manuf. Div. Prod Planning
		50		0730	1600
Saturdays:					
Sundays, holidays					

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

***(Account for 24 hours a day. If unoccupied, put in zero)**

25-3

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter:	**Day____ °F. dB____ mph wind**	**Night____ °F. dB____ mph wind**
Summer:	**Day____ °F. dB____ mph wind**	**Night____ °F. dB____ mph wind**

MAINTAINED INDOOR CONDITIONS:

Winter:	**Day____ °F. dB____ %rh**	**Night____ °F. dB____ %rh**
Summer:	**Day____ °F. dB____ %rh**	**Night____ °F. dB____ %rh**

M'L 73F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors ✓ Fin tube_____ Perimeter

Ceiling or wall panels_____ Unit heaters_____ Other Forced Air -

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating _____

Demand limiters _____

Energy storage _____

Heat recovery wheels _____

Enthalpy control of supply-return-exhaust damper _____

Recuperators _____

Others _____

LIGHTING:

Interior lighting type: _____

Watts/ft^2: Hallway/corridor _____

Work stations _____

Circulation areas within work space _____

On-off from breaker panel _____ Wall switches _____

Control switching _____

Exterior Lighting: Type _____ Total KW _____

DOMESTIC HOT WATER HEATING:

Size _____ Rated input _____ Water Temp. 120 °F °F

Energy Source: Gas ____, Oil ____, Electric ____, Other Steam coil

Figure 15-14. Building Information (con't)

25-5

Manuf 2 & 3 floor
F96 T12-CW } 2 tubes in 3-tube fixture

OPERATION Operations Offices LOCATION Bldg 25 DATE 10/17/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS FC	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
54L 400 MetalArc R	1		17	455	25				} MANUF ENG BRANCH
MS 400/3K/HOR			27						
			6						Tool & Dye
			6						Copy Room
			31						Production & Planning
			14						PP&C
			15						Production Control
			10						Quality Control
			8						Computer Center
									PP&C Conf room - 12 FL 35W 2 tubes needs Occup Sensor
			21						Supply Div
			4						CIM Branch
			159						

159 × 400 = 63,600

180 × 300 = 30,000

Figure 15-16. Energy Survey - Lights

25-6

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
25 - MANUFACTURING	3RD FL	1	MS400	159	159	455	72,345	11	198,949	
	1/2ND FLS	2	F96T12	2,800	5,600	175	490,000	24	2,940,000	
	TOTALS			2,959	5,759		562,345		3,138,949	
			SQ. FT. =	182,550						
			WATTS/SQ. FT. =	3.1						
	OFFICES		SQ. FT. =	60,850			72,345		198,949	
			WATTS/SQ. FT. =	1.2						
	SHOPS		SQ. FT. =	121,700			490,000		2,940,000	
			WATTS/SQ. FT. =	4.0						

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 25 DATE: 10-18-91

Notes & Comments: Building Contact : Ted Kawalcek

2 Rooftop package units
Manufactured by Trane
Model # SLHCC 604 HA 63C8 4D3D 00AM4BFN
460 v, 3ϕ
2 compressors, 51 A
6 condenser Fan, 1hp each
1 evaporator Fan, 30 hp
1 exhaust fan, 10 hp
Equiped for economizer cycle
Outside air dampers were about 50% open when the O.A. temperature was ~ 55°F.

Add thermostatic control valves to hallway and bathroom radiators

Third Floor exhaust fans are controlled by a time clock located in the third floor equipment room - Currently the fans are on all weekend - Set to turn fans off on Friday afternoon and on Monday morning.

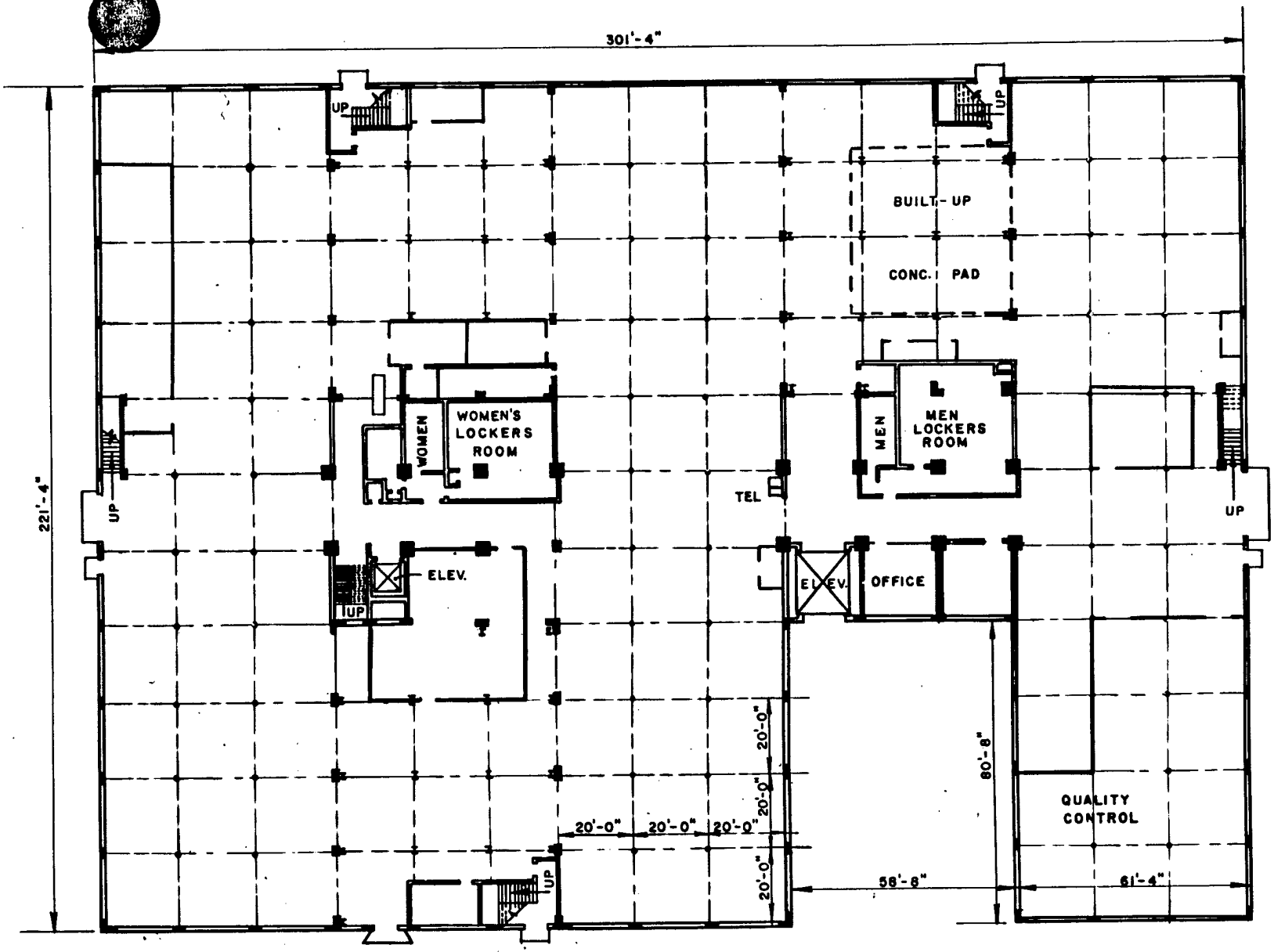
BLD 25-3 1983 HVAC
Trane Rooftop 2 Units 60 Ton ea,
VAV system - electronic control
Dx cooling ; H.W. heat

Components Repl: Compressor 1986 N. unit
Master energy controller 1985 " "

BLD 25-3 Computer Rm. 1983 Tem, Hum.
1. Trane Computer Rm AC 1983 10. Ton
Dx ; Electric heat ; Elec-stm humidifier

2. Airflow Computer Rm AC 1986
Dx ; Elec heat ; Elec-stm hum.
Microprocessor control

Recommendation : The older Trane AC is being retained as a back-up unit. Therefore, an auto. start should be installed for the back-up AC in event of the failure of the primary system. during off hours/weekends.



25-10

NET FLOOR AREA
60,850
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

WATERVLIET ARSENAL

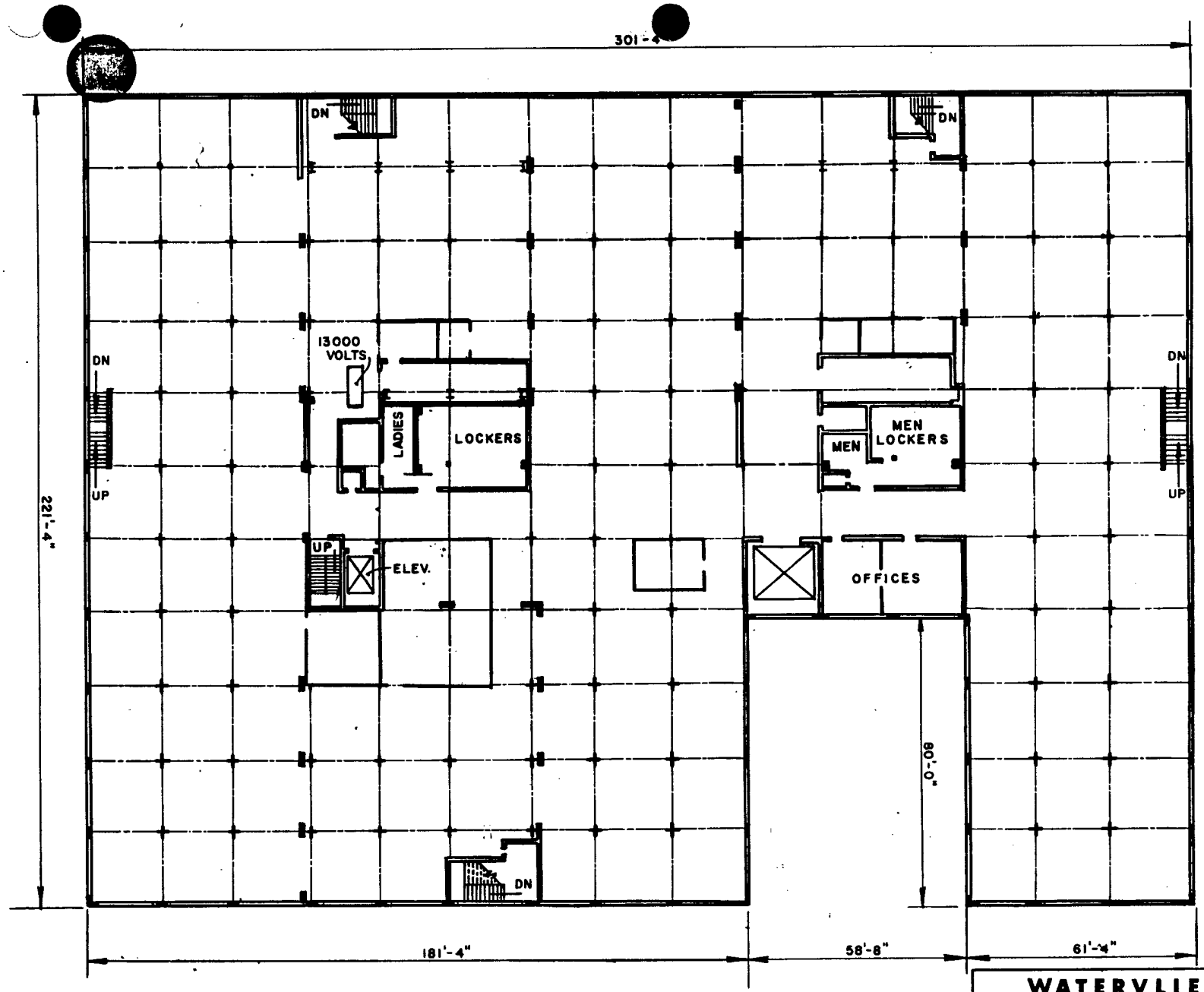
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by: J.C. Kachmann

FIRST FLOOR PLAN
MACHINE SHOP
BUILDING NO. 25

Revisions	Date

Scale: 40'=1'-0" Date:



25-11

NET FLOOR AREA
Square feet
FLOOR CAPACITY
Per square foot

N

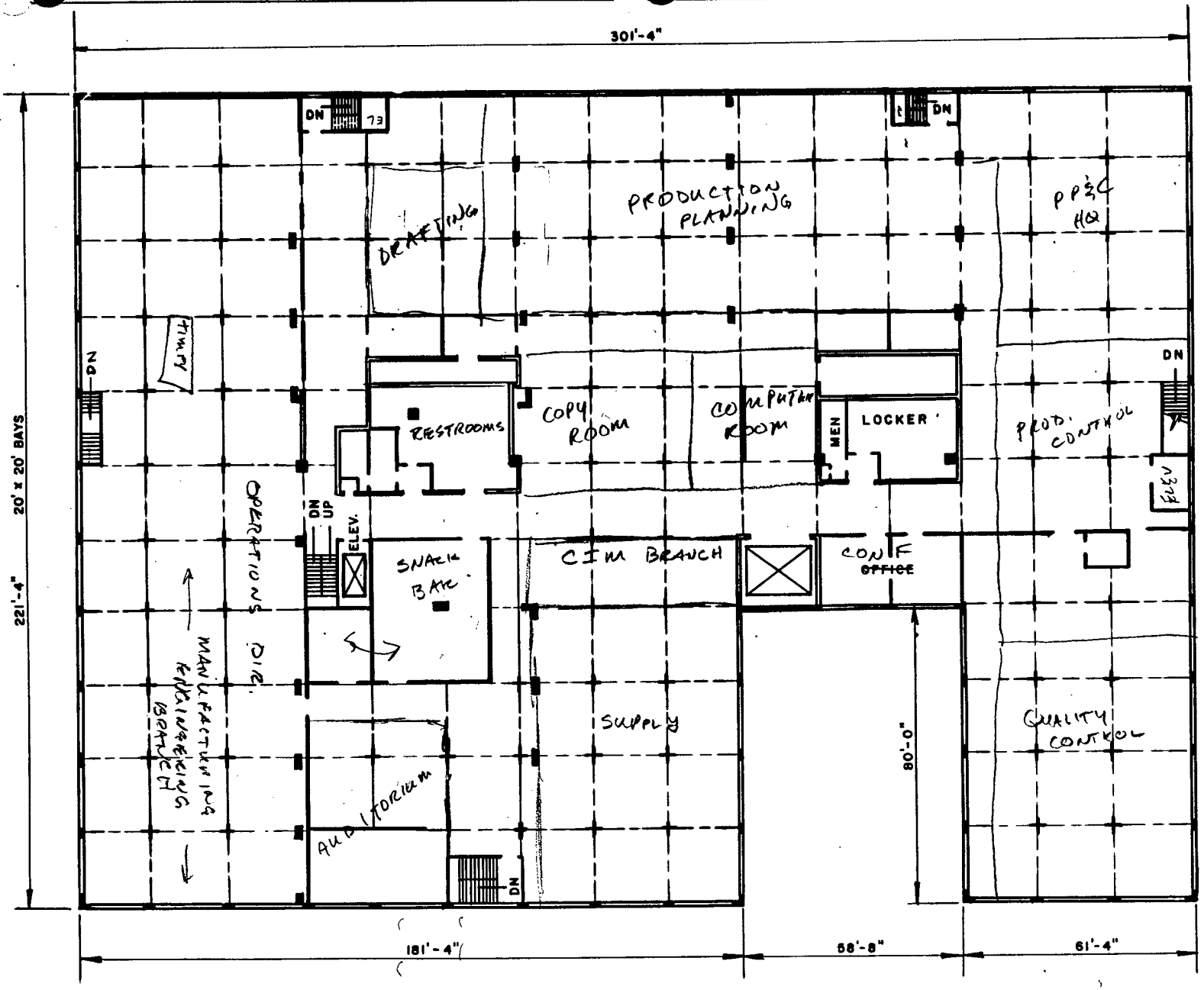
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR PLAN
MACHINE SHOP
BUILDING NO. 25

Scale: 1"= 40'-0" Date:

Revisions	Date



25-12

NET FLOOR AREA
Square feet
FLOOR CAPACITY

B205
35

WATERVLIET ARSENAL
WATERVLIET, N.Y.
Drawn by: J.R.GANGEMI, Approved by:

THIRD FLOOR PLAN
MACHINE SHOP
BUILDING NO. 25

Revisions	Date

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 35 DATE: 10-18-91

Notes & Comments: Building Contact : Ted Kawalek

9 Heating and Ventilating Units
Located on the roof
Steam heating coils
Steam lines uninsulated inside blower
Manufactured by Barry Blower
30 hp fan motor
7 units have return air
Outside air dampers close at 55°F
Steam turns on at 60 °F

3LD 35-2 Classrooms 1983 HVAC - Temp
Trane AC 25 Ton
DX Cold Deck ; Stm. Hot Deck
Control : Honeywell Pneumatic
Zone damper control (4 zones)

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/16/91

IDENTITY:

OPERATION Storehouse & Museum

Address Bldg 38

Type(s) of occupancy Museum in front part / Unheated storage in rear

Name of person in charge of energy William Bradford / Chuck Zimmerman

38-1

PHYSICAL DATA:

Building orientation Front faces North

No. of floors 1

Floor area, gross, square feet 29,400

Net air conditioned square feet Only enclosed museum space

Construction type:

Walls (masonry, curtain, frame, etc.) Steel

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat _____ Color: Light _____

Pitched ✓ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Single	25%
S	"	"
E	"	"
W	"	"

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None _____ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam - forced air in museum only

BUILDING OCCUPANCY AND USE:

Weekdays: Occupied by:* 3 people from 0730 to 1600 (hours)

Saturdays:

Sundays, holidays

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

*(Account for 24 hours a day. If unoccupied, put in zero)

2. **ENVIRONMENTAL CONDITIONS**

OUTDOOR CONDITIONS

Winter: Day_____ °F. dB_____ mph wind Night_____ °F. dB_____ mph wind

Summer: Day_____ °F. dB_____ mph wind Night_____ °F. dB_____ mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____ °F. dB_____ %rh Night_____ °F. dB_____ %rh

Summer: Day_____ °F. dB_____ %rh Night_____ °F. dB_____ %rh

M'd 75F Poor heating in upstairs office - only 1 convector

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors_____ Fin tube_____

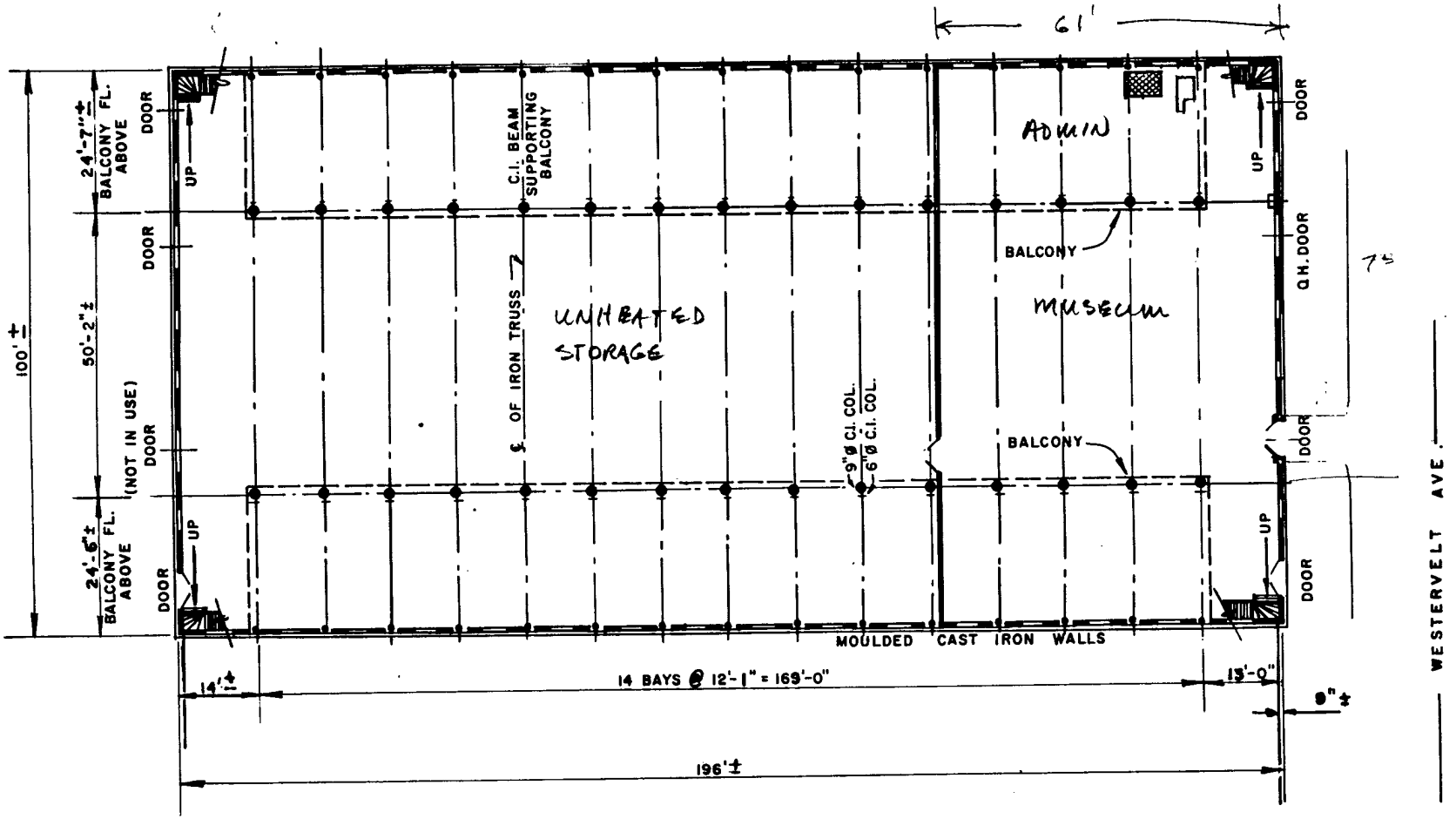
Ceiling or wall panels_____ Unit heaters_____ Other_____

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)



38-5

NET FLOOR AREA
19100 (BALCONY 8450)
Square feet

FLOOR CAPACITY
1000 LBS+195 LBS BALCONY
Per square foot

N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

GROUND FLOOR PLAN
STOREHOUSE & MUSEUM
BUILDING NO. 38

Scale: 1"=30'-0" Date:

Revisions	Date

Surveyed by: P. Hutchins

Survey Date: 10/18/91

1. **GENERAL INFORMATION**

IDENTITY:

OPERATION Benet Labs

Address Bldg 40

Type(s) of occupancy Admin / Labs / Fam Hsg.

Name of person in charge of energy Gary Conlon

PHYSICAL DATA:

Building orientation Front faces East

No. of floors 2

Floor area, gross, square feet 192,221

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

2 ND Floor has been remodeled with new hot water heating system
1 ST Floor is being remodeled in the same manner.

40-1

Roof:

Type: Flat _____ Color: Light ✓

Pitched ✓ metal Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Double	
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh ✓ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam - new systems use hot water converter

BUILDING OCCUPANCY AND USE:

Weekdays: Occupied by:* ? people from 0730 to 1600 (hours)

Saturdays: _____ _____ _____

Sundays, holidays _____ _____ _____

Hours air conditioned: Weekdays from____to____; Saturdays____to____ Sundays, holidays from____to____

*(Account for 24 hours a day. If unoccupied, put in zero)

40-3

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

M'd 75F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. B.136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard ✓ Convectors_____ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other Forced air + perimeter hot water

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

A/C on 1ST/2ND Floors toward building front

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size 80 gal Rated input_____ Water Temp. 110 °F

Energy Source: Gas____, Oil____, Electric ✓, Other_____

Figure 15-14. Building Information (con't)

OPERATION Benet Labs LOCATION Bldg 40 DATE 10/18/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
Lights have been renovated 2nd Floor offices - going to do same on 1st Floor									
Energy savers 2 tube/Fixture 34 watts w/ reflector (picture									
F40	2		18						2nd Fl unrenovated
w/ Diffusers			12						
F40 cw	4								2nd Floor classrooms
	(2 removed)		22						w/o reflector
	↓		28						↓
F40/diffusers	4								Library
	(2 removed)		16						↓
F40/diffusers	4(2 removed)		30						1ST FLOOR LABS
	↓		8						↓
F40/diff	2		32						Security
F96 8'	2		64						Turret Labs
Philips F40 c-w	2		48						Machine Shop
			60						
F96 8'	2		30						Gym
F40	4/2rem		20						CPO
1	1		8 30 30						1

Figure 15-16. Energy Survey – Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
40 -										
BENET LABS	2ND FL	2	F40T12	80	160	96	7,680	11	21,120	
	LIBRARY	2	F40T12	66	132	96	6,336	11	17,424	
	1ST FL	2	F40T12	208	416	96	19,968	11	54,912	
	LABS	2	F40T12	76	152	96	7,296	11	20,064	
				430	860		41,280		113,520	
	TURRET LABS/GYM	2	F96T12	94	188	175	16,450	11	45,238	
	TOTALS			524	1,048		57,730		158,758	

SQ. FT. = 44,148
WATTS/SQ. FT. = 1.3

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: P. Hutchins Bldg. # 40 DATE: 10/18/91

Notes & Comments:

- Employment Office - at end of North wing will not be renovated. Has convectors under windows with T'stats - Some manual valves. Window A/C - 2-paned windows
- Foundry Wing - Old 1-pane windows 75% of wall is glass - Tank assembly wing is similar - Unit heaters are steam fed.
- South wing has manually-controlled convectors (steam) under windows on 1ST and 2ND floors

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 40 DATE: 10-17-91

Notes & Comments: Building Contact: Ted Kawalcek

CADD Room / Print Shop: 12ft ceiling, ~19' x 164'

Split System

Direct expansion cooling:

252 mbh sensible cooling

90 mbh latent cooling

342 mbh total cooling capacity

Steam Coil heating:

398 mbh heating capacity

Manufactured by Carrier Corp.

Evaporator model # 40 RR 034

12000 cfm supply air

7.5 hp fan motor

Economizer cycle

Needs dampers on the outside air and exhaust air ducts to balance the system.

Currently sucking air from exhaust and outside air ducts instead of return air.

Located in ceiling above the print shop.

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 40 DATE: 10-17-91

Notes & Comments:

CADD Room / Print Shop (continued):

Condenser model # 38 AD034620

Air Cooled

3 Fan motors, 1 3/4 hp each

1 compressor motor, 460 v, 50 RL Amps

Measured Data:

From supply air ducts

Area	Duct Size	Avg. Vel. Pressure
Print Shop	21" x 21"	0.0539 in w.g.
CADD Room	Get from Plans	0.0666 in w.g.

Micro-Graphics Lab & Microfilm Room:

Split system, Direct expansion cooling

Manufactured by Carrier

Condensing Unit: 3 stages

Model # 38 ADO 28610

3 fans, 1 3/4 hp each

1 compressor, 460 v, 54.4 A

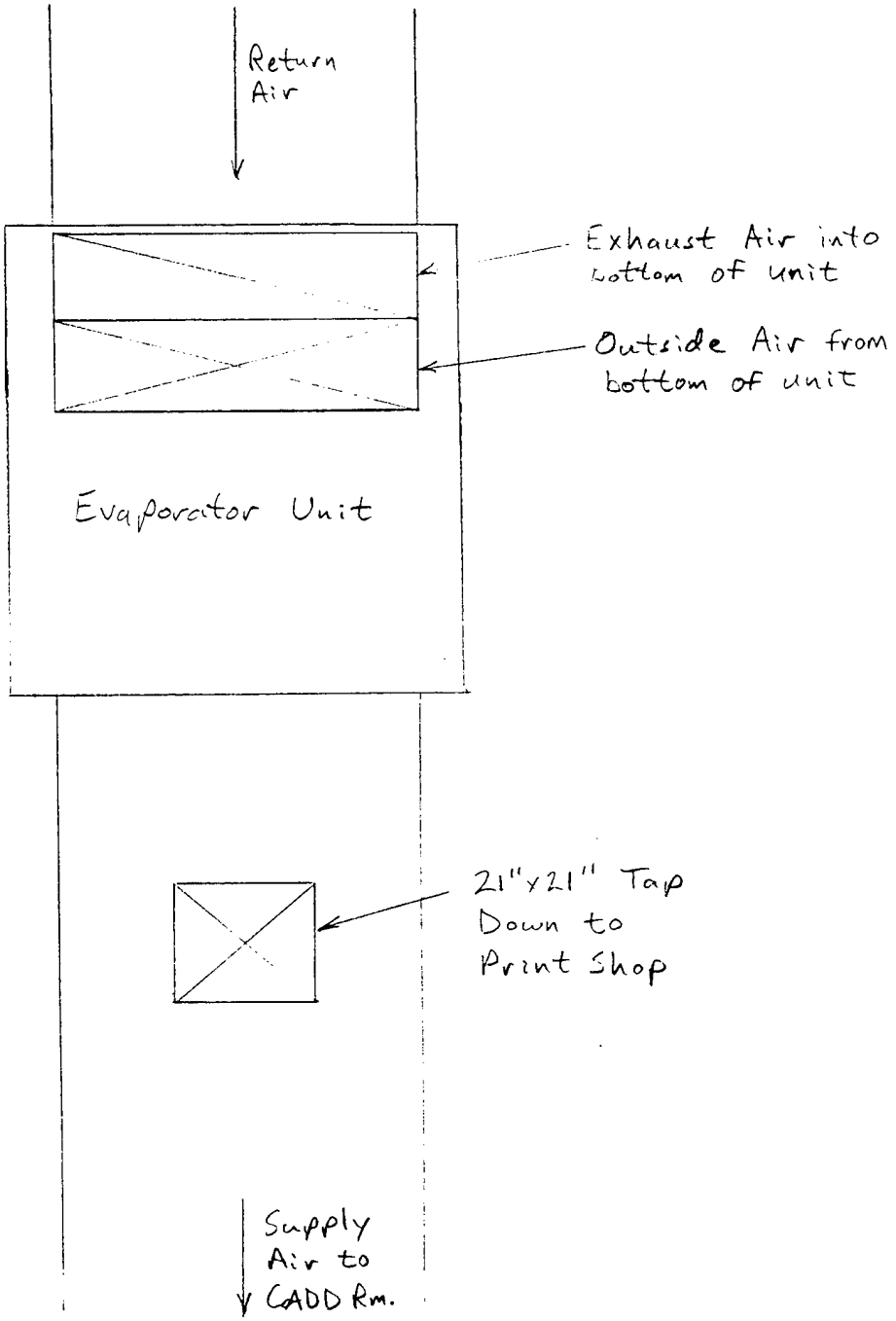
Micrographics lab evaporator unit recieves its "fresh" air from the hallway

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 40 DATE: 10-17-91

CADD Room/Print Shop Evaporator Unit

Top View



BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 40 DATE: 10-17-91

Notes & Comments:

Micro-Graphics Lab/Microfilm Room (Continued):

ECO Possibilities:

1) Add Chilled water lines to serve the Micrographics Lab, MicroFilm Room and the CADD Room; (Capacity is now available) and install new fan coil units.

2) Add Outside air intake For Micro-Graphics Lab (Darkroom). Use economizer cycle for cooling.

Electric Boiler:

Located in First floor compressor room

Provides humidification For 2nd Floor

Manufactured by Sussman

Model No. ES90, Serial No. N5-11254-Z80

480v, 3ø, 90kw

Blowdown water was very dirty (use water treatment?)

2 similar boilers are located in Building 125

BLD 40 Microfilm 1976 HVAC Tem/Hu
Carrier AC 25 Ton
Dx cool ; stm + electric heat ; stm hum.
Control : Pneumatic - electric

Components replaced :
Compressor - 1980, 1982, 1984
Value plates and/or gaskets 1985, 86
Cond fan motor - 1981, 84

Recommendation : Re-design or replace system
AC serves two areas with widely different load requirements resulting in inefficient operation and costly wear + tear on units.

Outside air could be much better utilized during cold weather for cooling requirements.

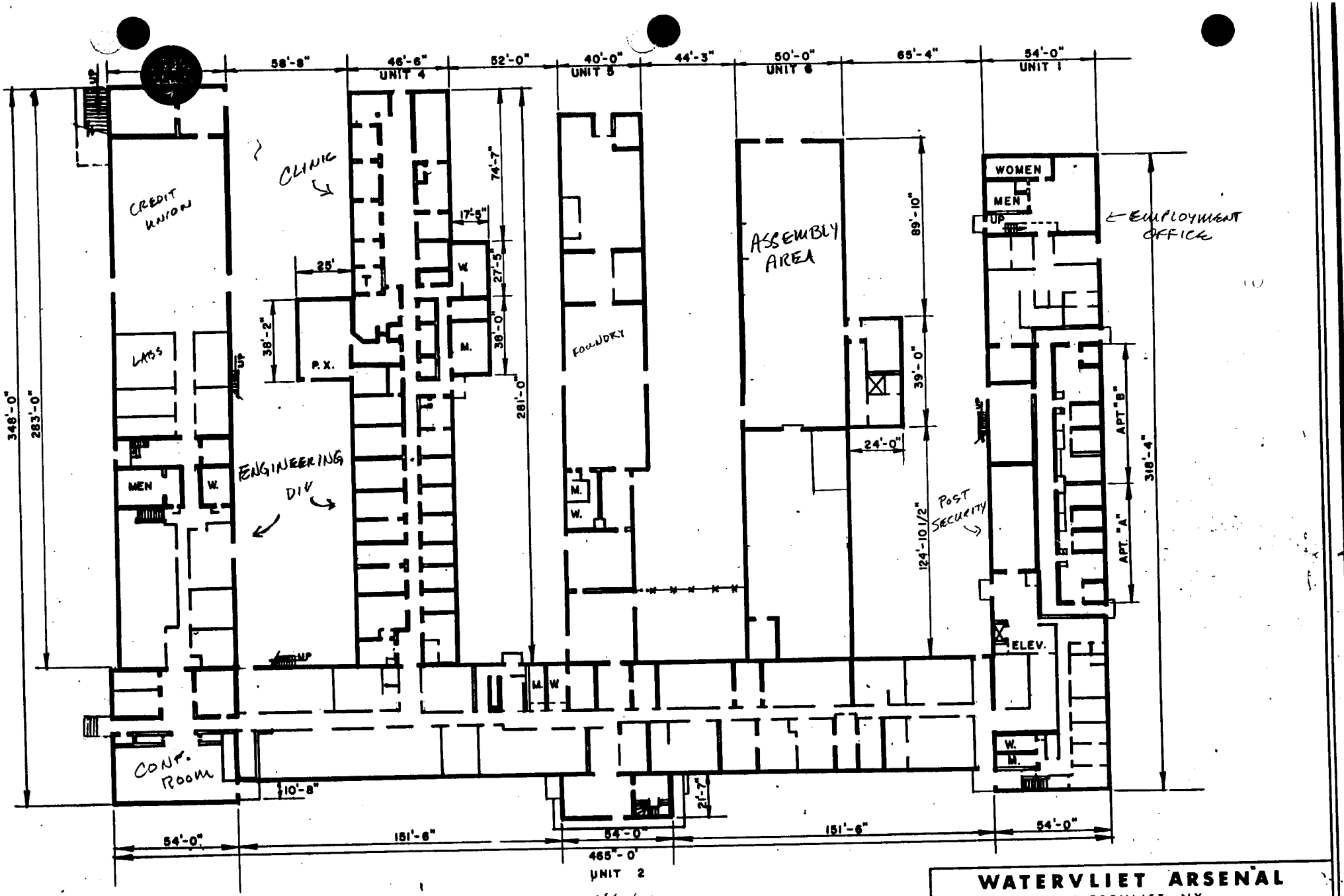
BLD 40 - 4 Drafting Room 1973 HVAC Temp/4
Carrier 5 Ton
Dx cool ; Elec reheat ; stm. humidifier
Control : Pneumatic - electric

BLD 40 N. Conf. Room 1973 Temp.
Carrier AC - 11 Ton

Comment : Very limited use - Summer cooling when needed

BLD 40 S. Conf. Rm 1967 Temp.
Carrier AC - 10 Ton
Dx cool - 2 stage ; Elec. heat - 8 stages
Charcoal Filter

Comment : Limited use - Summer cooling or Winter heating when in use



NET FLOOR AREA
138,969
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

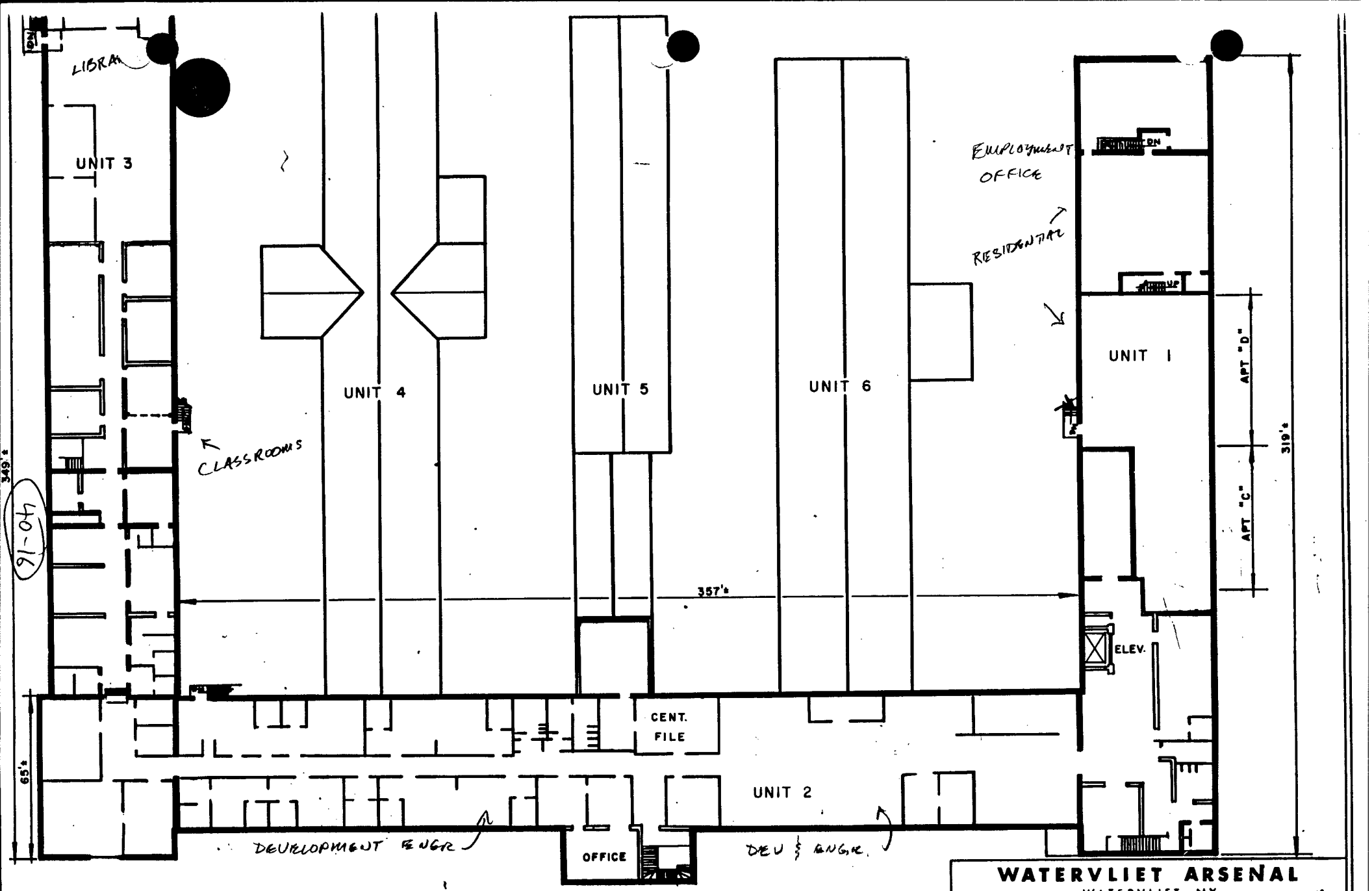
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

FIRST FLOOR PLAN
BENET LABORATORIES
BUILDING NO. 40

Revisions	Date

Scale: NO SCALE Date:



NET FLOOR AREA
Square feet

FLOOR CAPACITY
54 LBS
Per square foot

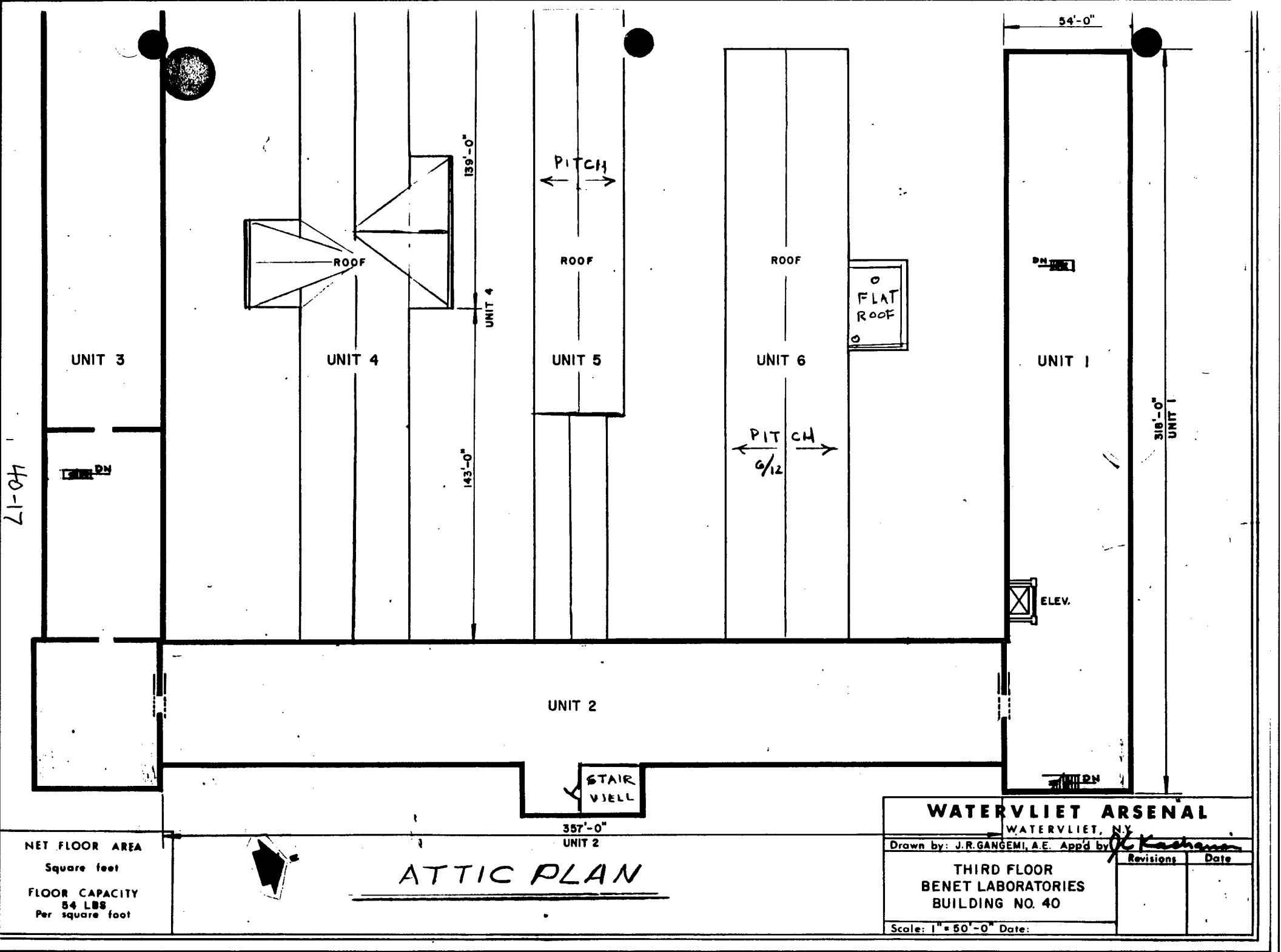
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

SECOND FLOOR
BENET LABORATORIES
BUILDING NO. 40

Scale: 1"= 50'-0" Date:

Revisions	Date



ATTIC PLAN

NET FLOOR AREA
Square feet

FLOOR CAPACITY
54 LBS
Per square foot

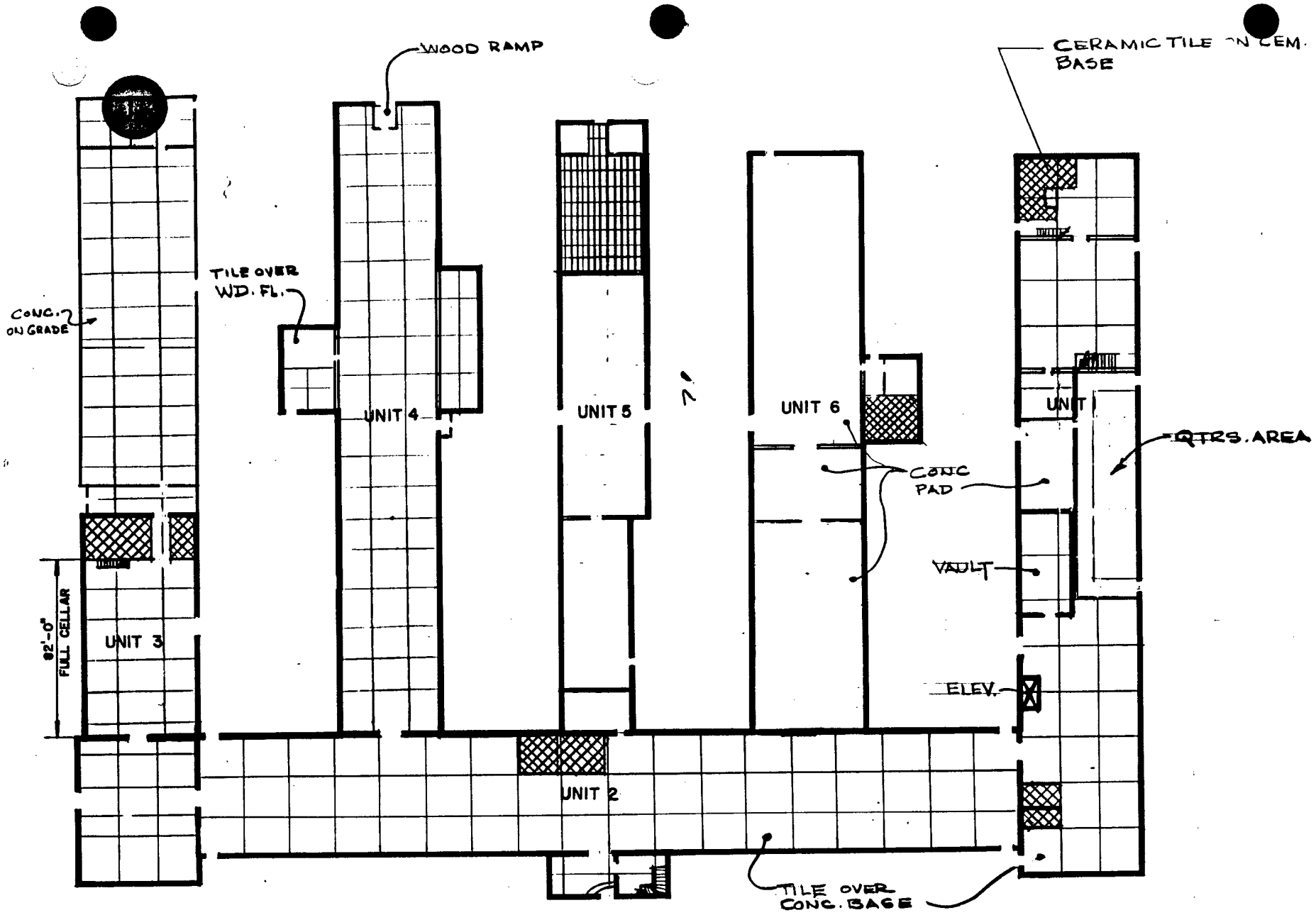
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. Appd by: [illegible]

THIRD FLOOR
BENET LABORATORIES
BUILDING NO. 40

Scale: 1" = 50'-0" Date:

Revisions	Date



BASEMENT

81-94

NET FLOOR AREA
Square feet
FLOOR CAPACITY
Per square foot

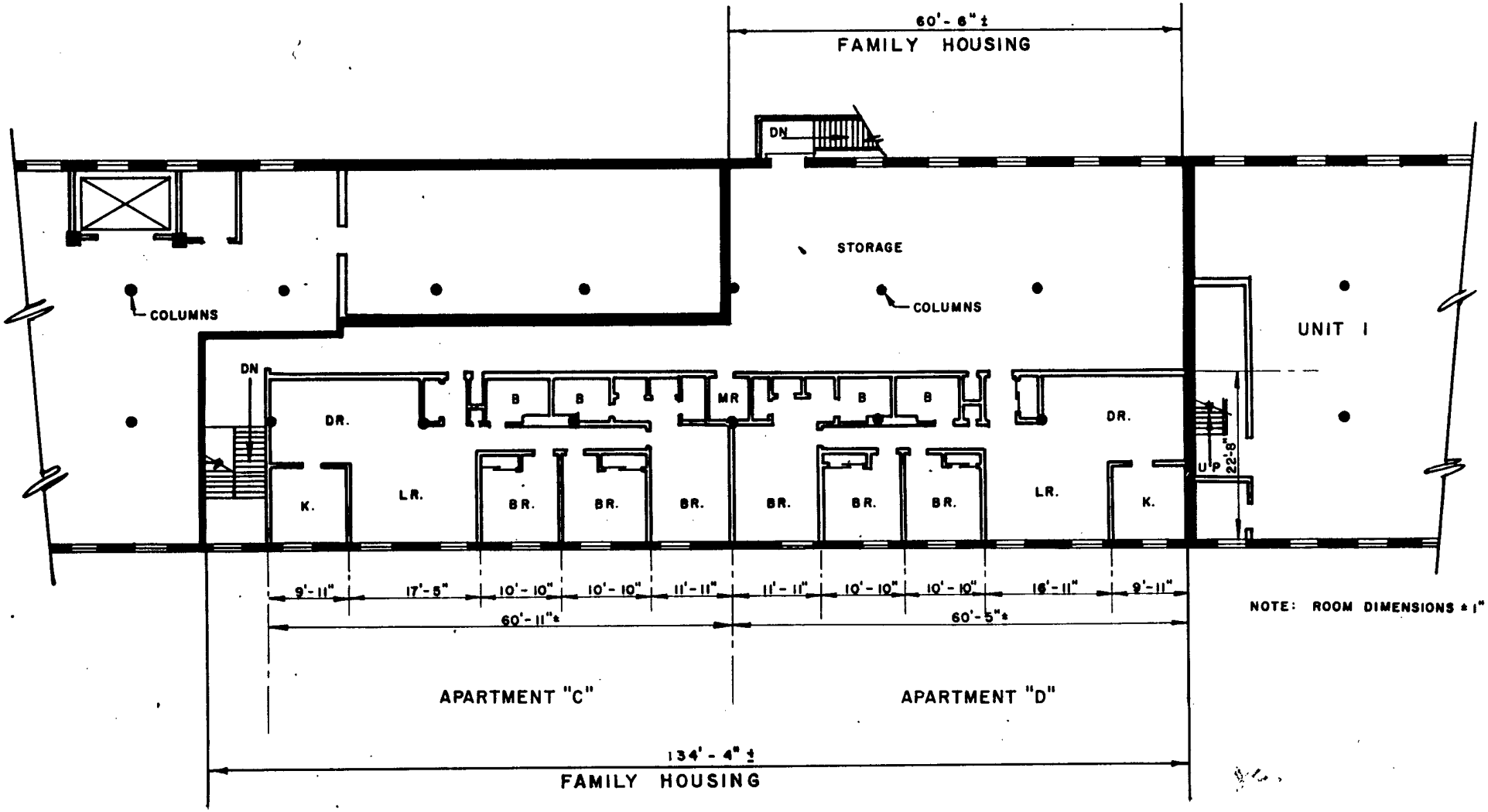
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by: J.C. Kaschmann

Revisions	Date

BENET LABORATORIES
BUILDING NO. 40

Scale: 1" = 60'-0" Date:



NOTE: ROOM DIMENSIONS ± 1"

NET FLOOR AREA
Square feet
FLOOR CAPACITY
54 LBS
Per square foot
9'-6" ± CLG. HT.

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by: JC Beckmann

Revisions	Date

SECOND FLOOR
BENET LABORATORIES
BUILDING NO. 40

Scale: 1/16" = 1'-0" Date:

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 10/15/91

IDENTITY:

OPERATION Dalliba Hall Product Assurance Div. / Info Mgmt Div.

Address Bldg 44 Eg Test Mgr.

Type(s) of occupancy Admin - first floor
Basement -

Name of person in charge of energy Bill O'Hara

PHYSICAL DATA:

Building orientation Front faces north

No. of floors 1, plus basement

Floor area, gross, square feet 61,278

Net air conditioned square feet

Construction type: red brick

Walls (masonry, curtain, frame, etc.)

N ~ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat ✓ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	double	15 / 3 windows per 20'
S		ea 1½' x 6'
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds ✓ Drapes, open mesh _____ Drapes opaque _____ None _____ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS: 100' ↕ ← 360' → N ↑

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam heating

Ht. and A/C Steam perimeter in older part, but not in newer (East side)
Computers and equip gen. ht in SE corner
Feel airflow from old to new (West to East)

BUILDING OCCUPANCY AND USE:

	Occupied by:*	people from	to	(hours)	
Weekdays:	90	0730	1600		Product Assurance Computer People
	450	0730	1600		
	5	0730	1600		TMDE
	3	1600	2400		Night shift
	—	—	—		
Saturdays:	—	—	—		
Sundays, holidays	—	—	—		

Hours air conditioned: Weekdays from — **to** —**; Saturdays** — **to** — **Sundays, holidays from** — **to** —

***(Account for 24 hours a day. If unoccupied, put in zero)**

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

measured 75-77°F Admin.
71F 45%RH controlled area

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors ✓ Fin tube_____ East wing only

Ceiling or wall panels_____ Unit heaters ✓ Other_____ West basement only

Forced air system throughout building

Cooling plant:

Chillers: No. 2 Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating ✓ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others Economizer on ventilation system

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____ Rated input_____ Water Temp._____ °F

Energy Source: Gas____, Oil____, Electric____, Other_____

Figure 15-14. Building Information (con't)

PRODUCT ASSURANCE

OPERATION BUILDING ~~44~~ LOCATION _____ DATE 10/15/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	FC ~~LUMENS~~	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
4' w/diffusers	4	1st Fl	60	184	60-40	7:30-4	5		Some lights disconnected - check w/ FE shop. - did not count
wall switches (A)		NW (A)							
"	"	(B)	7	184	40				
8' fixtures 110/bulb	~~3~~ 2	(C)	3	252	45				110 w/bulb
		1							
	~~3~~	(D)	120	~~184~~ 142	50				New Area ~~12x20~~
	3		~~64~~	142					
EST →	2		5						(2/3 taken out)
	4	(E)	66	184	100				Lab/Chemist controls ~~11~~ 6
8' fixtures	2	(F)	9	252					Sm Equip Rm
4'	4	(G)	31	184	110				TMDE Support groups (sm room)
	4	(H)	46	184					like area A/other side of wall
4' w/reflectors	2	(I)	39	92	35-40	F40T12 (?)			Basement Computer Room
		+4 ↗	~~84~~						
Occupancy Sensor?	2	*	2						Break Room
8'	2	(J)	58	252					Basement ~~was~~ gage warehouse
	2	(K)	10	252					Basement coating area (lights on after hours)
4'	2	↓	1	92					
Mercury Vapor		(L)							Basement shop
4'	2		3	92					Break Room
	2		4	92					Shop
8'	2		2	252					
	2	Hall	1	252					
	2	Hall	2	92					

Figure 15-16. Energy Survey - Lights

19.5 x

Bldg 44

Domestic hot water ht. _____ _____ _____ _____

Other (describe:_____) _____ _____ _____ _____

12. LIGHTING

1. Interior Lighting Type Fluorescent

   Watts/Ft.^{2} Offices _____ Other _____

   Total Install KW _____ Foot Candles _____

   On-Off from Breaker Panel? _____

   Wall Switch? yes - most offices Control Switching? _____

   Operating Schedule _____

2. Exterior Lighting Type _____

   Total KW _____

   Operating Schedule _____

3. Remarks

   _____

Figure 15-14. Building Information (con't)

44-7

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
44 - PRODUCT	E	4	F40T12	66	264	192	12,672	11	34,848	
ASSURANCE	A	4	F40T12	60	240	192	11,520	11	31,680	
	H	4	F40T12	46	184	192	8,832	11	24,288	
	G	4	F40T12	31	124	192	5,952	11	16,368	
	B	4	F40T12	7	28	192	1,344	11	3,696	
	D	3	F40T12	120	360	144	17,280	11	47,520	
	D	3	F40T12	64	192	144	9,216	11	25,344	
	I	2	F40T12	43	86	96	4,128	11	11,352	
	D	2	F40T12	5	10	96	480	11	1,320	
	L	2	F40T12	4	8	96	384	11	1,056	
	L	2	F40T12	3	6	96	288	11	792	
	HALL	2	F40T12	2	4	96	192	11	528	
	I	2	F40T12(?)	2	4	96	192	11	528	Reflectors
	K	2	F40T12	1	2	96	96	11	264	
				454	1,512		72,576		199,584	
44 - PRODUCT	J	2	F96T12	58	116	175	10,150	11	27,913	
ASSURANCE	K	2	F96T12	10	20	175	1,750	11	4,813	
	F	2	F96T12	9	18	175	1,575	11	4,331	
	C	2	F96T12	3	6	175	525	11	1,444	
	L	2	F96T12	2	4	175	350	11	963	
	HALL	2	F96T12	1	2	175	175	11	481	
				83	166		14,525		39,944	
	TOTALS			537	1,678		87,101		239,528	

SQ. FT. = 60,000
WATTS/SQ. FT. = 1.5

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 44 DATE: 10-15-91

Notes & Comments: Building Contact: Ted Kawalcek
1st Floor has about 100 occupants

AC-5 serves the 1st Floor for occupant comfort.
Chilled water cooling coil
Low pressure steam heating coil (preheat position)
Barber-Coleman controls include economizer cycle
25 hp supply Fan
5 hp return Fan

Data from Plans:
Supply air = 20,050 cfm
Min. Outside air = 5400 cfm
945 MBH Cooling, 7.5 hp pump motor
Ch. Water: 42°F EWT, 52°F LWT, 183 gpm
Cooling Coil: 35 sq. ft. face area
EAT = 84.5 °F db / 68.2°F wb
LAT = 55.6 °F db / 54.6 °F wb

Measured Data:
Pressure drop across steam coil = 0.86 - 0.41 = 0.45 in w.g.
Supply fan static pressure = 0.75 in w.g.
25% outside air at minimum setting - by Ted during previous Test & Balance

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 44 DATE: 10-16-91

Notes & Comments:

HV-1 Serves basement offices, stove room and metal testing labs. located in the lower basement mechanical room.
Operates 24 hrs, 7 days
30 hp fan motor, 37 A, 460 v, 3 ø, 865 RPM

Measured Data:
Motor amps = 15 A
motor speed = 715 rpm

Data from plans: (Dwg. # 7557-5255, sheet 55)
Supply air = 34,390 cfm, 100 % O.A.
Hot water coil: 2847 MBH, 285 GPM
EAT = 2°F, LAT = 77°F
EWT = 180°F, LWT = 160°F
HW From steam converter
15 hp HWS pump motor

Steam - Hot water converter for HV-1:
5000 MBH, 500 gpm, 15 hp HWS pump motor
160 °F EWT, 180 °F LWT
5 psig steam supply, 5210 lb/hr

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 44 DATE: 10-16-91

Notes & Comments:

Electric Boiler:

Serves 1st floor and basement areas.
Located in the upper basement mech. room.
Used for humidification, reheat and heating for AC-5.
Manufactured by Hydro Steam Industries
Model # SDR 2448-21-4B
25 lb max. operating pressure (MWAP)
710 lb/hr steam at 210 KW, 480 V, 3 ϕ
Has 36 elements installed at 5000 w each
Maintenance must manually blow down the boiler every day, and remove scale about 4 times per year.
Ted estimated about 40 manhours per year for maintenance.

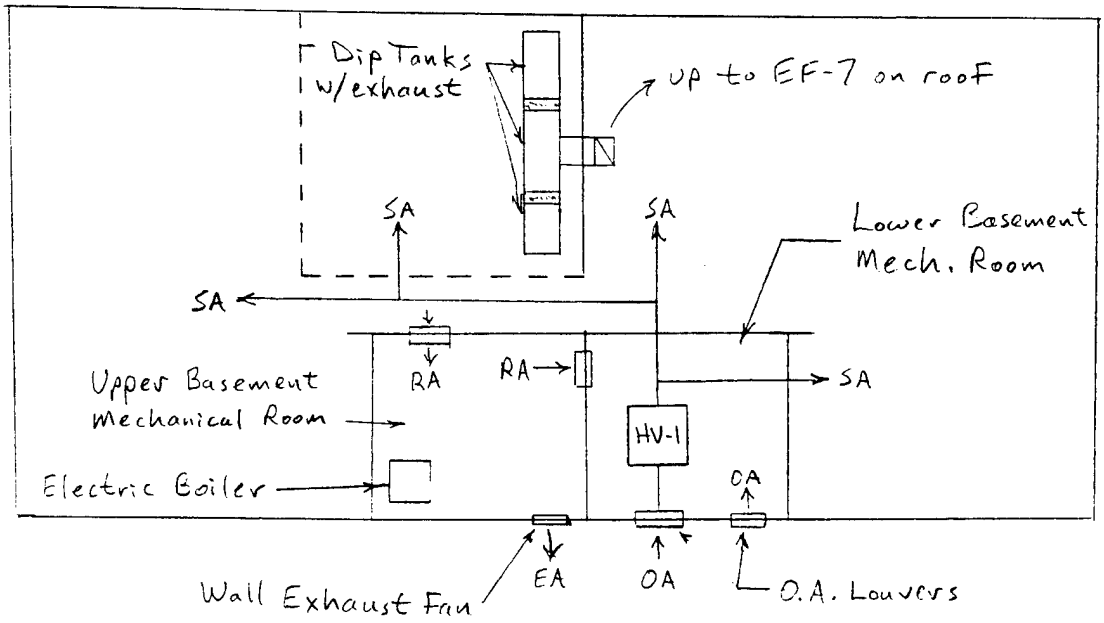
Exhaust Fan #7:

2 speed, manual control (located in dip tank area)
7.5 Hp Fan motor
"Fast" setting, 7520 cfm, 1 shift, 5 days
"Slow" setting, 3760 cfm, nights, 5 days
Off, No exhaust, weekends

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 44 DATE: 10-16-91

Basement Plan



BLD 44 METROLOGY LAB 1977 HVAC Temp/Hum
Dunham-Bush - 75 Ton Chilled water system
C.W. cooling ; Hw reheat ; Stm humidifier
Controls : Barber Colman - pneumatic-elec.

Components replaced ;

Compressor or stator	1980, 81, 82, 83
Chiller	1984
Cond Fan motor	1986

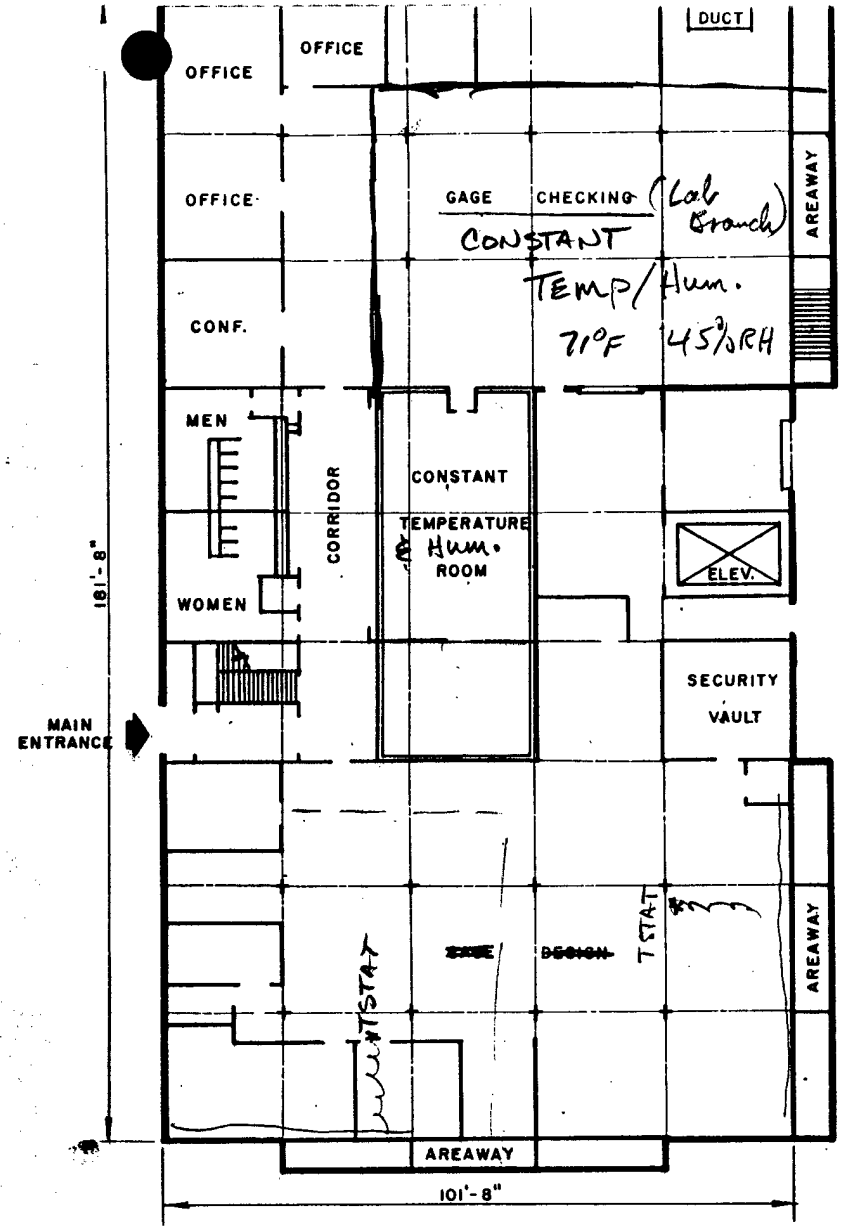
Comment: There is constant demand on CW + HW heat. Water treatment is very important and was not initiated until system was several years old.

BLD 44 PAD / MISD OFFICES 1977 Temp
Dunham-Bush 90 Ton
C.W. cool ; Stm preheat, HW zone reheat
Controls : Barber Colman pneumatic-elec

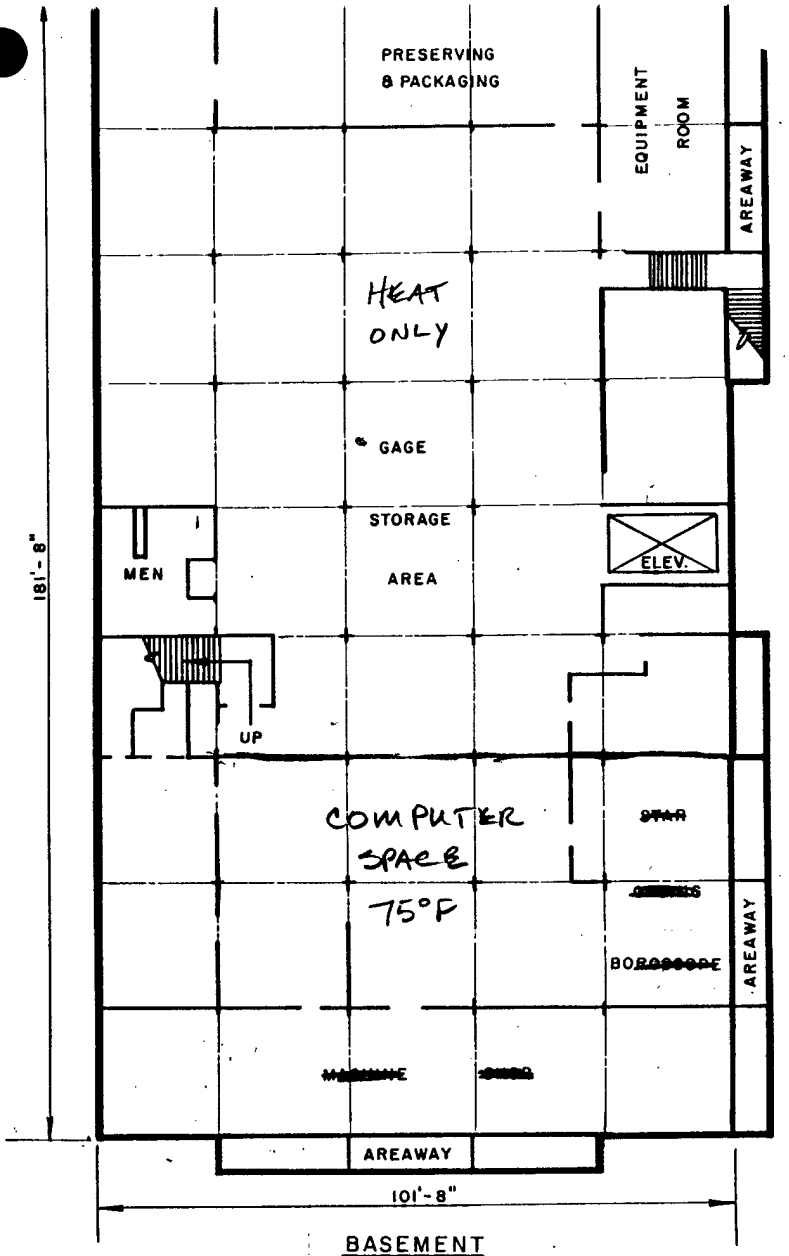
Components replaced:

Compressor / Stator	1981, 84
Chiller	1983

Comment: Same as above for Metrology Lab.



FIRST FLOOR



BASEMENT

Acceptance Test
New areas use hot water

N4

NET FLOOR AREA	
Square feet	
FLOOR CAPACITY	
1ST FL. 100LBS - 2ND FL. 100LBS	
Per square foot	

BEM - Bill O'Hara

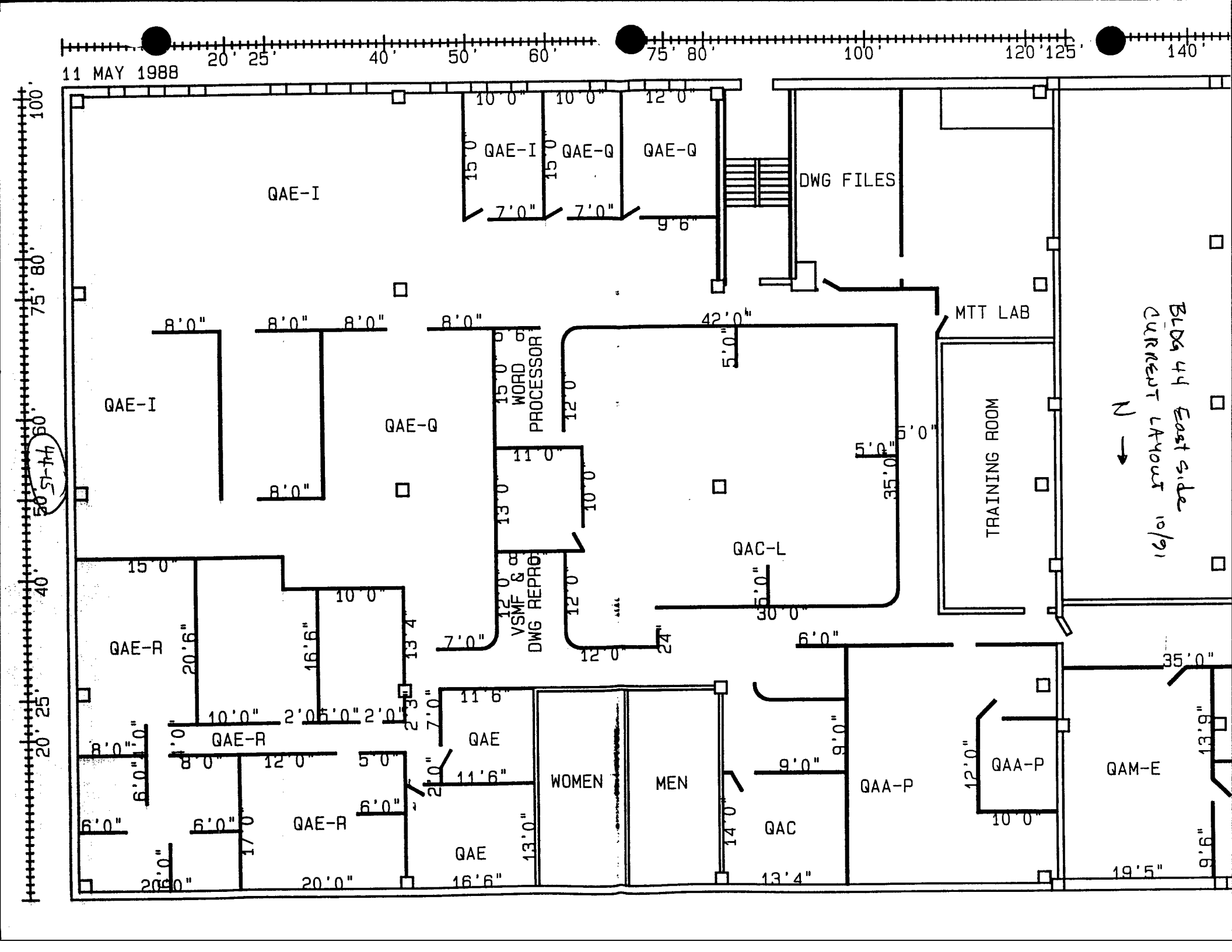
WATERVLIET ARSENAL
WATERVLIET, N.Y.

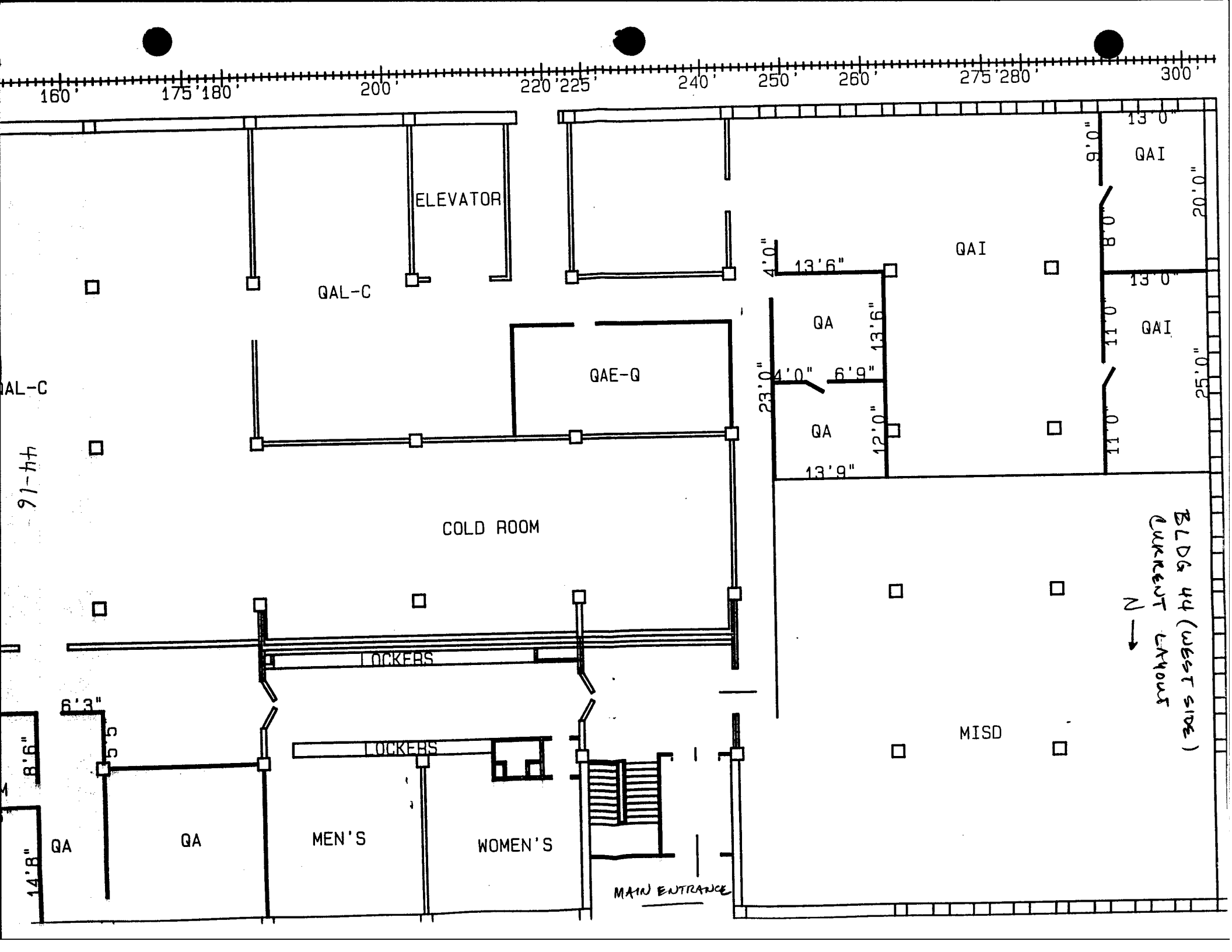
Drawn by: J.R.GANGEMI, A.E. App'd by:

DALLIBA HALL
BUILDING NO. 44

Scale: 1"= 30'-0" Date:

Revisions	Date


11 MAY 1988
QAE-I
QAE-I
QAE-Q
QAE-Q
DWG FILES
MTT LAB
TRAINING ROOM
BLDG 44 East side
CURRENT LAYOUT 10/91
N
QAE-I
QAE-Q
WORD PROCESSOR
VSMF & DWG REPRO
QAC-L
QAE-R
QAE-R
QAE-R
QAE
QAE
WOMEN
MEN
QAC
QAA-P
QAA-P
QAM-E


160'
175'180'
200'
220'225'
240'
250'
260'
275'280'
300'
ELEVATOR
QAL-C
QAE-Q
QAL-C
91-44
COLD ROOM
LOCKERS
LOCKERS
6'3"
5'5"
8'6"
14'8"
QA
QA
MEN'S
WOMEN'S
MAIN ENTRANCE
QAI
13'0"
9'0"
20'0"
QAI
4'0"
13'6"
QA
13'6"
QAI
13'0"
11'0"
23'0"
4'0"
6'9"
25'0"
QA
12'0"
11'0"
13'9"
MISD
BLDG 44 (WEST SIDE)
CURRENT LAYOUT
N

OPERATION Telecommunications Room LOCATION Bldg 110 DATE

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F40	4		6						
Rest of Lights			U-Tube Fluorescents						

Figure 15-16. Energy Survey – Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
110 - MANUF.		2	F90T12	100	200	200	20,000	24	120,000	
		3	F40T12	100	300	144	14,400	24	86,400	
		2	F96T12	324	648	175	56,700	24	340,200	
	TOTALS			524	1,148		91,100		546,600	

SQ. FT. = 69,525
WATTS/SQ. FT. = 1.3

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: _____

IDENTITY:

OPERATION Heavy Caliber Tube Bldg. Telecommunications Bldg.

Address Bldg [redacted] 112

Type(s) of occupancy Electronics / Computers / Admin

Name of person in charge of energy Edward Maruszcak / Jim Kief (Telephone Rm.)

PHYSICAL DATA:

Building orientation East side near center of Bldg 110

No. of floors 1

Floor area, gross, square feet ~40 x 40

Net air conditioned square feet ~ 1600 ft²

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E — W —

112-1

Figure 15-14. Building Information

Roof:

Type: Flat _____ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	—	0
S	—	0
E	—	0
W	—	0

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None ✓ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam baseboard + A/C

112-2

BUILDING OCCUPANCY AND USE:

Weekdays: Occupied by:*_____ people from _____ to _____ (hours)

_____ _____ _____

_____ _____ _____

_____ _____ _____

_____ _____ _____

Saturdays: _____ _____ _____

Sundays, holidays _____ _____ _____

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Mid 74F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard ✓ Convectors_____ Fin tube_____

Ceiling or wall panels_____ Unit heaters_____ Other_____

Cooling plant:

Chillers: No. 1 Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating ✓ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper Needs better control in winter

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____ Rated input_____ Water Temp. _____ °F

Energy Source: Gas____, Oil____, Electric____, Other_____

Figure 15-14. Building Information (con't)

Surveyed by: P. Hutchins
Survey Date: 10/16/91

1. **GENERAL INFORMATION**

IDENTITY:

OPERATION Maggs Research Center

Address Bldg 115

Type(s) of occupancy Admin, Lab, Test cells (High Pressure) on 1st Fl

Name of person in charge of energy John Wrzochalski

PHYSICAL DATA:

Building orientation Long Dimension Runs N/S

No. of floors 2

Floor area, gross, square feet 49,926

Net air conditioned square feet

Construction type:

Walls (masonry, curtain, frame, etc.)

N masonry S ✓ E ✓ W ✓

Figure 15-14. Building Information

Source of heating energy:

Hot water_____ Steam_____ Electric resistance_____ Other_____

Heating plant:

Boiler No. _____ Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Ext Offices East side — Hand valves: 1st Fl West side control valves

Type: Baseboard_____ Convectors ✓ Fin tube_____

Ext Offices West side

Ceiling or wall panels_____ Unit heaters ✓ Other_____

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Specially conditioned Test cells on 1st FL - Production Area (High bay)

115-4

(Admin)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____ Rated input_____ Water Temp. 120 °F

Energy Source: Gas____, Oil____, Electric____, Other Steam

Figure 15-14. Building Information (con't)

OPERATION MAGGS RESEARCH CTR LOCATION BLDG 115 DATE 10/16/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
									MV lights in high bay
	2	Halls		92					
	3	Lab Office	#28	142					Lab 2nd Fl
	3		112	142					Outside offices
	3		12						Break Room (Occ. Sensor?)
	3		54	142					Inside Offices
	3		35	142					Computer - 2nd Fl
4'	4		7	184					1st Fl Mez
8'	2		16	252					1st Fl High Bay
4'	2		60	92					
4	2		36	92					1st Fl offices
4	2		74	92					"
4	2	Lab	33	92					
8'	2		10	254					Lab
4'	2		4	92					"
4	2		31	92					Lab
4	2		46	92					"
4'	2		100	92					Hallways

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
115 - MAGGS RESEARCH CENTER	2ND FL	2	F40T12	10	20	96	960	11	2,640	
		3	F40T12	28	84	144	4,032	11	11,088	
		3	F40T12	112	336	144	16,128	11	44,352	
		3	F40T12	12	36	144	1,728	11	4,752	
		3	F40T12	54	162	144	7,776	11	21,384	
		3	F40T12	35	105	144	5,040	11	13,860	
	1ST FL	4	F40T12	7	28	192	1,344	11	3,696	
		2	F40T12	16	32	96	1,536	11	4,224	
		2	F40T12	60	120	96	5,760	11	15,840	
		2	F40T12	36	72	96	3,456	11	9,504	
		2	F40T12	74	148	96	7,104	11	19,536	
		2	F40T12	33	66	96	3,168	11	8,712	
		2	F40T12	4	8	96	384	11	1,056	
		2	F40T12	31	62	96	2,976	11	8,184	
		2	F40T12	46	92	96	4,416	11	12,144	
		2	F40T12	40	80	96	3,840	11	10,560	
				598	1,451		69,648		191,532	
	1ST FL	2	F96T12	10	20	175	1,750	11	4,813	
	TOTALS			608	1,471		71,398		196,345	
			SQ. FT. =	58,000						
			WATTS/SQ. FT. =	1.2						
	1ST FL		SQ. FT. =	32,500			35,734		98,269	
			WATTS/SQ. FT. =	1.1						
	2ND FL		SQ. FT. =	15,500			35,664		98,076	
			WATTS/SQ. FT. =	2.3						

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 115 DATE: 10-16-91

Notes & Comments: Building Contact : Jimmy Yetto

Chillers:

Located in the First Floor mechanical room.
Manufactured by the Trane Company
2 Centravac, centrifugal type, 2 stage chillers
Installed in 1973
460 V, 3 Ø, 183 A
185 Tons each, one is a back-up
15 hp chw supply pump
30 hp condenser water supply pump
Controls maintain 48-50° CHWS Temp.

AHU #1:

Located in first floor mechanical room.
Provides outside air with steam preheat to 6 fan coil units on the first floor.
Cooling is provided by chilled water coils in the Fan Coil units, Room air is recirculated.

Measured Data:

Duct	Duct Size	Avg. Vel. Press.
Main Supply	36"x24"	0.1650
Mech. Rm. Vent	10"x10"	0.0805
Rm. 118 Takeoff	8"x6"	0.2290

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 115 DATE: 10-17-91

Notes & Comments:

AHU #1 (continued):

Static pressure across the Fan:

Supply 0.4694 in w.g.

Return -1.007 in wg.

Total 1.4764 in w.g.

Motor Data: 1 - 7.5 hp motor drives 2 Fans

460 V, 3 Ø, 10 Amp, 1740 RPM

Readings: 5 amps, 923 RPM

AHU # 2:

Located in crawl space above the second Floor storeroom.

Serves the 2nd Floor fan coil units with outside air, Room air is recirculated by F.C.'s

Has a steam preheat coil

Manufactured by The Trane Company

Climate Changer, Type M-12

48°F outdoor air, 71°F discharge air temps.

Fan motor data:

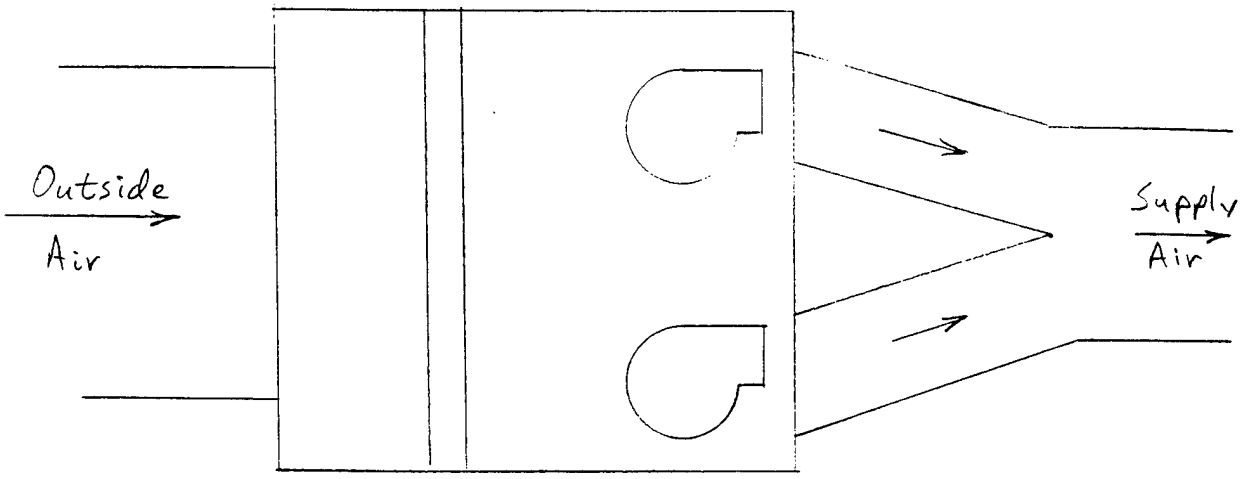
No nameplate, estimate between 2 - 5 Hp

Readings: 835 RPM, 2 amps

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 115 DATE: 10-17-91

Top View of AHU #1



BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 115 DATE: 10-17-91

Notes & Comments:

AHU #2 (continued):

Static pressure across the Fan:

Supply	0.3379	in. w.g
Return	-1.110	in w.g.
Total	1.4479	in w.g.

AHU #3:

Located in the crawl space next to the high bay area.

Serves the new control area with outside air, chilled water cooling and steam heating (in reheat position)

Motor Data: 2 hp Fan motor

430 v, 3 ø 1725 RPM

Reading: 840 RPM

Supply duct is 23" x 15"

Avg. Vel. Pressure reading = 0.2098 in w.g.

Static Pressure across the Fan:

Supply	0.3156	in w.g.
Return	-0.8747	" "
Total	1.1903	" "

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 115 DATE: 10-16-91

Notes & Comments:

Domestic Hot Water Heater:

Located in the first floor mechanical room

Manufactured by A.O. Smith

Model # DVE 120 730

Serial # 730-H-75-00272

480 V, 3Ø, 38.5 Amps

2 elements at 16 Kw each

Electric reheat coils are installed in 25 of the room fan coil units. They range from 3 to 28 amps. The Kilowatt rating from the plans are:

1) 6 Kw	10) 6 Kw	19) 4 Kw
2) 7.5 "	11) 7.5 "	20) 2 "
3) 2 "	12) 7.5 "	21) 4 "
4) 7.5 "	13) 10 "	22) 4 "
5) 3 "	14) 2 "	23) 4 "
6) 5 "	15) 3 "	24) 2 "
7) 2 "	16) 3 "	25) 3 "
8) 6 "	17) 3 "	
9) 3 "	18) 5 "	

REPLACEMENT - (FREE STANDING)

BLD 115 Computer Lab 1969 HVAC Tons/H

Carrier 28 Ton

Dx cooling ; elec. heat ; stm. humidify

Components replaced:

Compressor 1975, 80

Cond fan motors (3)

evap " " (2)

Comment: Constant demand on unit for HVAC

BLD 115 Weapons Dev 1971 HVAC

TRANE CENTRAVAC 2 Units 154 Ton ea

C.W. cooling ; HW heat

Main Air handlers AHU1 - 1st Floor

AHU2 - 2nd "

Stm. preheat ; CW cool ; Stm humidif

Fan coil Units: FC 1-7 1st Floor

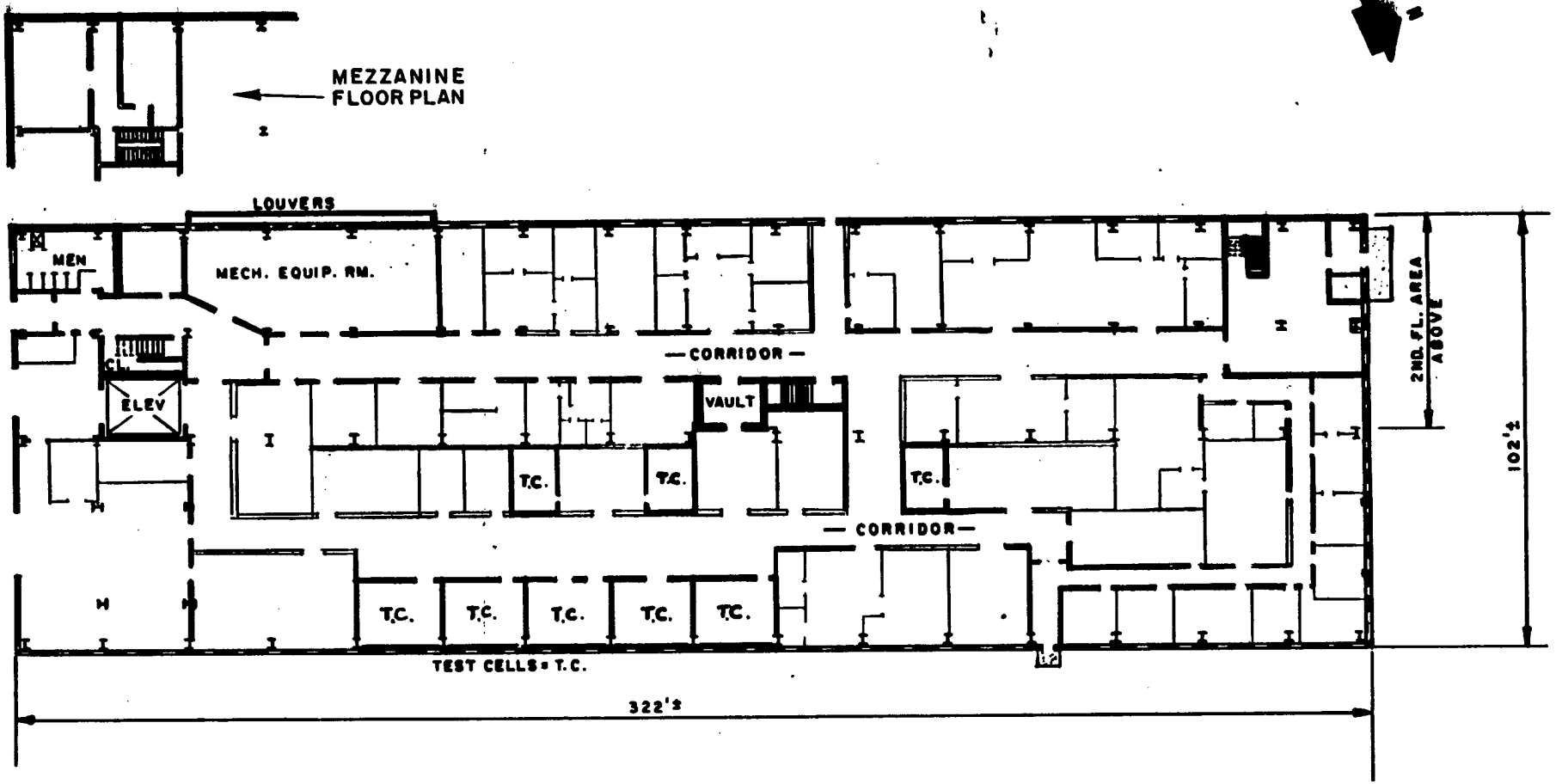
FC 8-11 2nd "

Controls: Johnson pneumatic

BLD 115 Weapons Dev 1980 HVAC
Addition to existing CW, HW system

Main Air Handler AH1
Stm preheat ; cw cool ; stm humid

Fan coils FC 1-6 CW cooling



91-511

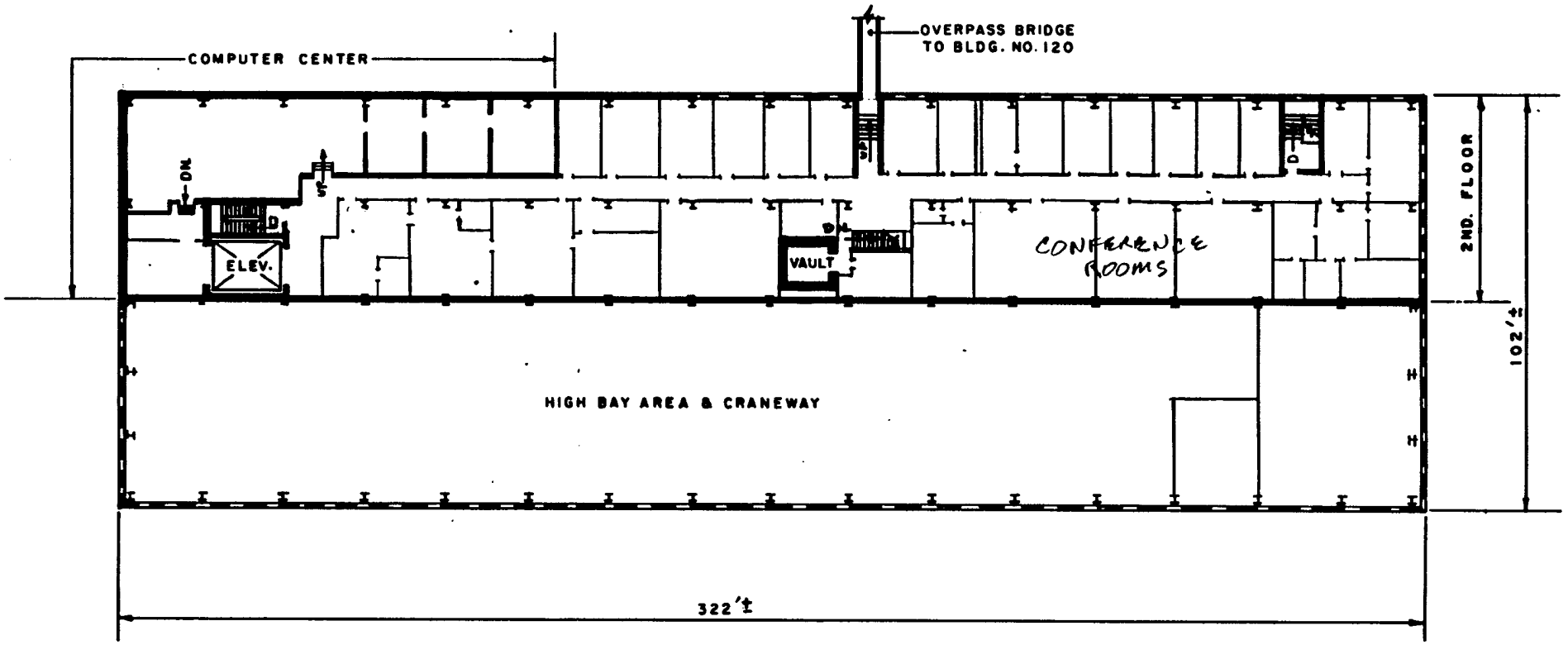
NET FLOOR AREA
32,500
SQUARE FEET

FLOOR CAPAC

WATERVLIET ARSENAL
WATERVLIET, N.Y.

DRAWN BY: E. LANSBURG APP'D. BY:

	REV.	DATE
FIRST FLOOR [redacted] R MAGGS RESEARCH BUILDING NO.	EL TR	2/76 4/76



91-511

NET FLOOR AREA
15,500 SQ. FT.

FLOOR CAPAC
300 LBS /SQ

WATERVLIET ARSENAL
WATERVLIET, N.Y.

DRAWN BY: E. LANSBURG APPD. BY:

SECOND FLOOR PLAN
MAGGS RESEARCH CENTER

REVISIONS	DATE
EL	2/76

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: 11/16/91

IDENTITY:

OPERATION Facilities Offices and Shops

Address Bldg 120

Type(s) of occupancy Admin 1ST Fl, Labs 2ND Fl, 3RD Shops/Storage

Name of person in charge of energy JACK Collins

120-1

PHYSICAL DATA:

Building orientation Building Front faces East

No. of floors 3

Floor area, gross, square feet 101,975

Net air conditioned square feet

Construction type:

Walls (masonry) curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Figure 15-14. Building Information

Roof:

Type: Flat ✓ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Single	10%
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None _____ Other Some have colored plastic sheets (East-facing offices)

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS.

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam perimeter with forced air central A/C

120-2

BUILDING OCCUPANCY AND USE:

	Occupied by:*	people from	to	(hours)	
Weekdays:	100	730	1600		
	2	1600	2400		Electrician/Plumber
	1	2400	0800		Plumber
Saturdays:	—	—	—		
Sundays, holidays	—	—	—		

Hours air conditioned: Weekdays from 730 to 1600; Saturdays — to — Sundays, holidays from — to —

*(Account for 24 hours a day. If unoccupied, put in zero)

120-3

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

meas'd 74F 3rd Fl
74-78 2
74 1

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube ✓ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units: 1ST FL 2ND FL with control valves - some don't work

Type: Baseboard ✓ Convectors ✓ Fin tube_____

Ceiling or wall panels_____ Unit heaters ✓ Other 3rd FL steam fed w/ T'STAT most pipe uninsulated 2ND FL convectors with remote control valve many traps leak part downcomers overheat prob!

Cooling plant:

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____ Individual room A/C units

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____Wall switches_____

Control switching_____

Exterior Lighting: Type_____Total KW_____

DOMESTIC HOT WATER HEATING:

Size_____Rated input_____Water Temp. 120 °F

Energy Source: Gas_____, Oil_____, Electric_____, Other_____

Figure 15-14. Building Information (con't)

120-5

Bldg 120

Domestic hot water ht.	_____	_____	_____	_____
Other (describe:_____)	_____	_____	_____	_____

12. LIGHTING

1. Interior Lighting Type Fl.

Watts/Ft.^{2} Offices _____ Other _____

Total Install KW _____ Foot Candles _____

On-Off from Breaker Panel? 3rd Fl 2 breaker boxes

Wall Switch? NA Control Switching? _____

Operating Schedule 7:30 - 4:00 Pm

2. Exterior Lighting Type _____

Total KW _____

Operating Schedule _____

3. Remarks

_____

Figure 15-14. Building Information (con't)

OPERATION Facilities Offices/Shops LOCATION Bldg 120 DATE 10/16/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	FC LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
4'	2	Shops	60	92	30				3rd Floor
8'	2	"	48	252	"				3rd Floor (stacks } wall
8'	2	"	24	252	"				3rd Fl } switches
									Daylight - switches could be off - Occupancy Sensors ?
4'	2	Mez	7	92					2nd Floor Mezzanine/Photo lab
4'	2	Halls	24	92					2nd Floor Hallway some disc.
4'	2(4)	Labs	20	92	125				2 tubes disc.
Power groove 8'	2	203	5	450	100				Rm 203
11	2	Labs	14	450					Other Labs -
4'	4	Lab	24	184	150			*(40)	Typical lab (Rm 244) Ten lab
4'	2	Conf Rm	2	92					Conf Rm (226) needs occup. sens
	2	Off	7	92					
F96T12 4'	2		96	184	25				1ST FL CARPENTER SHOP
	4	Office	6	184					Office
	4	Hall	7	184					Hall
	4	1	20	184					Face Area
	4	"	20	184					Other Mez
									Stairwells 4 fixtures/Fl 2 bulb 4'

Figure 15-16. Energy Survey - Lights

1ST FLOOR STORAGE (DRAWINGS) 60 FC
1ST FL LATRINE 40 FC

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
120 -	STAIRS	2	F40T12	12	24	96	1,152	11	3,168	
FACILITIES	3RD FL	2	F40T12	52	104	96	4,992	11	13,728	
OFFICES/SHOPS	2ND FL	2	F40T12	475	950	96	45,600	11	125,400	
	1ST FL	2	F40T12	88	176	96	8,448	11	23,232	
	MEZZ	2	F40T12	76	152	96	7,296	11	20,064	
				703	1,406		67,488		185,592	
	SHOPS	2	F90T17	126	252	215	27,090	11	74,498	Carpenter Shop
	2ND FL	2	F72PG17	30	60	380	11,385	11	31,309	Rm. 203 & 1ABS
	3RD FL	2	F96T12	79	158	175	13,825	11	38,019	
	1ST FL	2	F96T12	5	10	175	875	11	2,406	
				84	168		14,700		40,425	
	MEZZ	2	F40T12/U6	4	8	96	384	11	1,056	
	TOTALS			947	1,894		121,047		332,879	
			SQ. FT. =	95,965						
			WATTS/SQ. FT. =	1.3						
	1ST FL SHOPS		SQ. FT. =	22,500			27,965		74,498	
			WATTS/SQ. FT. =	1.2						
	MEZZ/1ST FL		SQ. FT. =	13,430			17,280		47,520	
			WATTS/SQ. FT. =	1.3						
	2ND FL		SQ. FT. =	31,000			56,985		156,709	
			WATTS/SQ. FT. =	1.8						
	3RD FL		SQ. FT. =	31,000			18,817		51,747	
			WATTS/SQ. FT. =	0.6						

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 120 DATE: 10-15-91

Notes & Comments: Building Contact : Jimmy Yetto

Ground Floor - Offices

1st Floor - offices and shops

Mezzanine - Offices

2nd Floor - Offices and laboratories

AHU #1 serves the ground Floor, 1st Floor and mezzanine with ventilation air, cooling and heating.

Located in the 1st Floor mechanical / storage room near the wood shop.

Multizone unit with 8 zones.

Operates 6am - 6pm, 5 days per week.
Controlled by a 24 hour / 7 day time clock.

Manufactured by Trane Company
Model # CCBA 1456 PAQ
7.5 hp motor, 480 v, 3ϕ
Readings : 7 amps, 997 RPM

Installed in 1979

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd/Green Bldg. # 120 DATE: 10/15/91

Notes & Comments:

AHU #1 (continued)

Design data: Supply Air 6250 cfm
Outside Air 930-6250 cfm
Steam coil 5psig, 73 lb/hr, 70 mBH
Ch. Wtr. Coil EWT=45°, LWT=55°F
175 mBH cooling
Heating EAT = 60°, LAT = 70°F

Measured Data:

Zone	Duct Size	Avg. Vel. Press.	As-Built CFM
1	14×14	0.1007 in.w.g.	1240
2	14×16	0.0467 "	1200
3	10×18	0.1039 "	1000
4	10×14	0.0162 "	600
5	10×14	0.0294 "	700
6	8×10	0.1167 "	450
7	8×10	0.1542 "	360
8	12×12	0.0343 "	700

Static Pressure at fan: Supply (+) 1.787
return (-) 0.6657
Total 2.4527 in. w.g.

BUILDING DATA NOTES - WATERVLIET ARSENAL

SURVEY BY: Todd / Green Bldg. # 120 DATE: 10-15-91

Notes & Comments:

The second floor labs are heated and cooled by individual room fan coil units.

The fan coil units utilize chilled water for cooling.

A central fan provides the (100%) outside air to the fan coil units. This Fan has a steam heating coil for winter operation.

The perimeter is heated with steam radiators - with steam from the main steam plant.

BLD 120-2 W. Side + Center Labs 1968
Dunham-Bush Chiller 150 Ton
C.W. cool Fan coil units 27
Control - Robertshaw pneumatic

Components replaced:

Chiller repaired leaks	1973	
" To be replaced	1986	
Compressor	1975	Both
Rebuilt	1974	one
"	1983	one

BLD 120-1 Offices 8 Zones 1980 HVAC
C.W. cooling; Addition To existing D.B.
150 Ton AC

Comment: AC or cooling in BLD 120 is basically CW chilled water dependent on some 200 Tons of refrigeration about 20 years old.

Both CW systems could be replaced by a single system OR existing CW piping could be joined and cooled by the 150 Ton units

Water Treatment, very important, was only started in 1983.

BLD 120-2 E. Side Labs 1964 HVAC

Trane 40 Ton

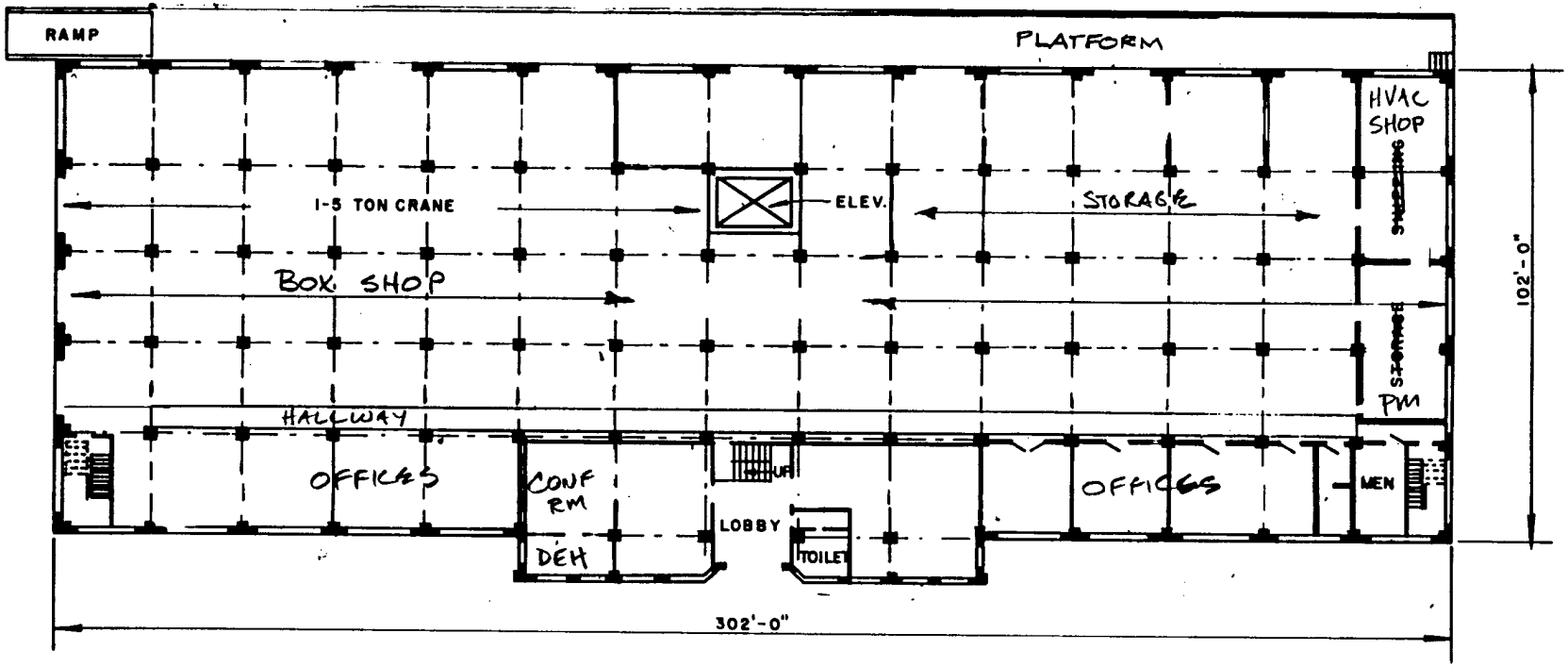
C.W. cooling ; elec heat ; Fan coil units (5)

Control - B.C. electric ; Robertshaw elec

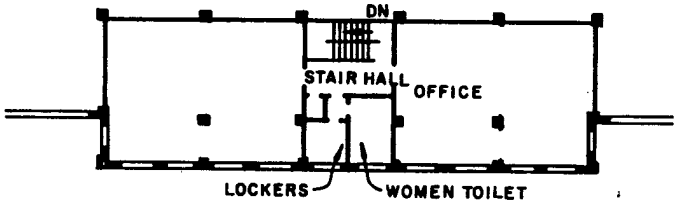
Components replaced

Water cooled Condenser + Tower replaced by air cooled condenser 1983

Compressor : 1972 81



BUILT 1941



MEZZANINE FLOOR PLAN

120-14

NET FLOOR AREA
31,000
SQUARE FEET
(FIRST FLOOR.)
FLOOR CAPACITY
1000 LBS
PER SQUARE FOOT
(FIRST FLOOR.)

NET FLOOR AREA
2,965
Square feet
(MEZZANINE FL.)
FLOOR CAPACITY
400 LBS
Per square foot
(MEZZANINE FL.)

N

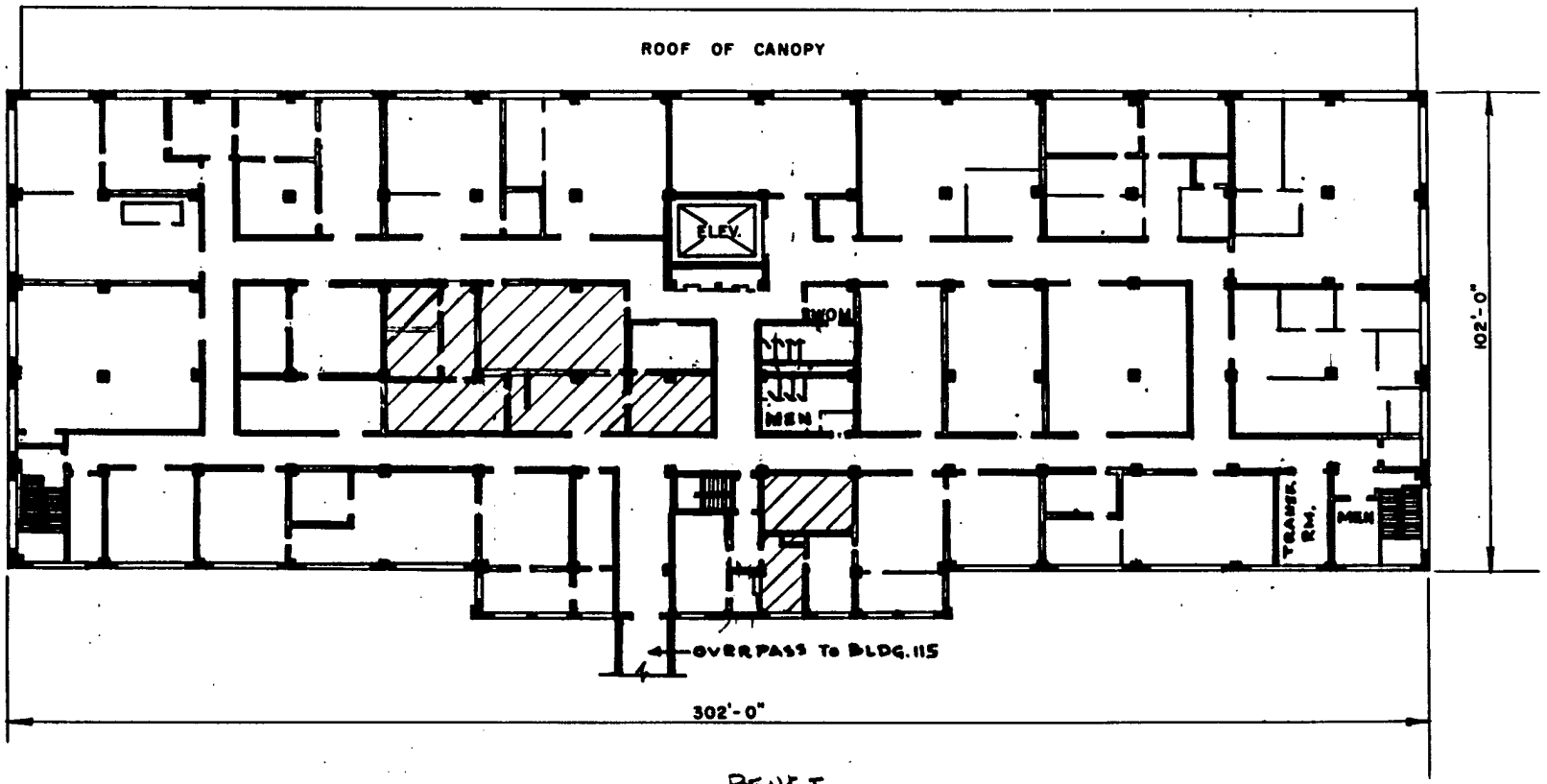
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

FIRST FLOOR PLAN
AND MEZZANINE
SUPPLY BUILDING
BUILDING NO. 120

Revisions	Date

Scale: 1"=40'-0" Date:



120-15

BENET
~~R & E~~ LABS

NET FLOOR AREA
31,000
Square feet

FLOOR CAPACITY
400 LBS
Per square ft.

N

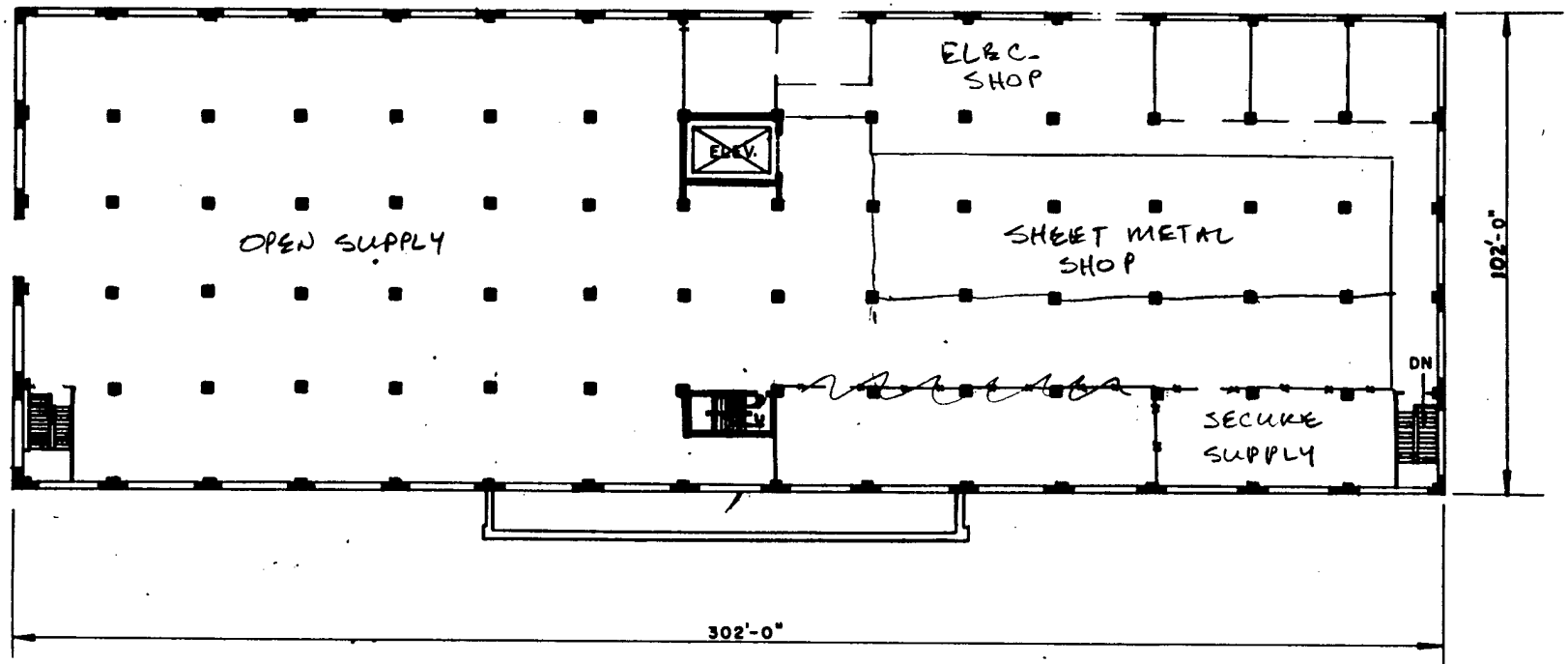
WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

Revisions	Date

SECOND FLOOR
R & E LA
BUILDING NO. 120

Scale: 1"=40'-0"



SUPPLY AREA

120-16

NET FLOOR AREA
30,000
Square feet

FLOOR CAPACITY
400 LBS
Per square foo

N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

Revisions	Date

THIRD FLOOR PLAN
SUPPLY BUILDING
BUILDING NO. 120

Scale: 1" = 40'-0" Date:

OPERATION CLEANING/DEGREASING Shop LOCATION BLDG 123 DATE

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F96T12/HO	2		21	252		24			
F96 PG17	2		12	150					

123-1

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
123 - CLEANING		2	F96T12/HO	21	42	255	5,355	24	32,130	
		2	F96PG17	12	24	460	5,520	24	33,120	
	TOTALS			33	66		10,875		65,250	
			SQ. FT. =	8,262						
			WATTS/SQ. FT. =	1.3						

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
124 - LABS/OFFICES		2	F40T12	180	360	96	17,280	11	47,520	
	TOTALS			180	360		17,280		47,520	
			SQ. FT. =	13,800						
			WATTS/SQ. FT. =	1.3						

OPERATION MANUFACTURING LOCATION 125 DATE

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F96T12/HO	2	BAYS 13-N	92	252		24			
F40T12	2		4	92		24			
BENET LABS - BLDG		124							
F40T12	2		90	92					

125-1

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
125 - MANUF		2	F96T12/HO	92	184	255	23,460	24	140,760	
		2	F40T12	4	8	96	384	24	2,304	
	TOTALS			96	192		23,844		143,064	

SQ. FT. = 16,000
WATTS/SQ. FT. = 1.5

Surveyed by: P. Hutchins

Survey Date: 11/16/91

1. **GENERAL INFORMATION**

IDENTITY:

OPERATION Storehouse / Processing Bldg

Address Bldg 130

Type(s) of occupancy Manufact / Supply Warehouse

Name of person in charge of energy Charlie Morse / Chuck Zimmerman

130-1

PHYSICAL DATA:

Building orientation Long dimension runs NE/SW

No. of floors 1

Floor area, gross, square feet 30,904

Net air conditioned square feet None

Construction type:

Walls (masonry, curtain, frame, etc.)

N ✓ S ✓ E ✓ W ✓

Roof uninsulated - can see underside - could put 6-8" insulation on underside

Steam lines (4) uninsulated - same with condensate lines

Figure 15-14. Building Information

Roof:

Type: Flat ✓ Color: Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N	Single	25%
S	—	—
E	Single	25%
W	Single	25%

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None ✓ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS.

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy _____

Other Steam-fed unit heaters w/ TSTATs

130-2

BUILDING OCCUPANCY AND USE:

	Occupied by:*	people from	to	(hours)
Weekdays:	7	0730	1600	Warehouse - manufacturing
Saturdays:	—	—	—	
Sundays, holidays	—	—	—	

Hours air conditioned: Weekdays from — to —; Saturdays — to — Sundays, holidays from — to —

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

Summer: Day_____°F. dB_____mph wind Night_____°F. dB_____mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Summer: Day_____°F. dB_____%rh Night_____°F. dB_____%rh

Measured - 75°F

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ Electric resistance_____ Other_____

Heating plant:

Boiler No. B. 136 Rating _____ MBH

_____ _____

_____ _____

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used_____ Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors_____ Fin tube_____

Ceiling or wall panels_____ Unit heaters ✓ Other_____

Cooling plant: No A/C

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size 80 gal Rated input_____ Water Temp. 120°F °F

Energy Source: Gas____, Oil____, Electric ✓, Other_____

Figure 15-14. Building Information (con't)

OPERATION Warehouse LOCATION Bldg 130 DATE 10/16/91

MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F96 8'	2		35						} Unit #2
F90 4'	2		9						
F40 4'									
F40 4'	2		36						Unit #1
F96 8'									
F96 8'	2		15						Unit #3
F96 8'	2		4						Office
F96 8'	2		27						Composite Area

all lights on Breaker boxes

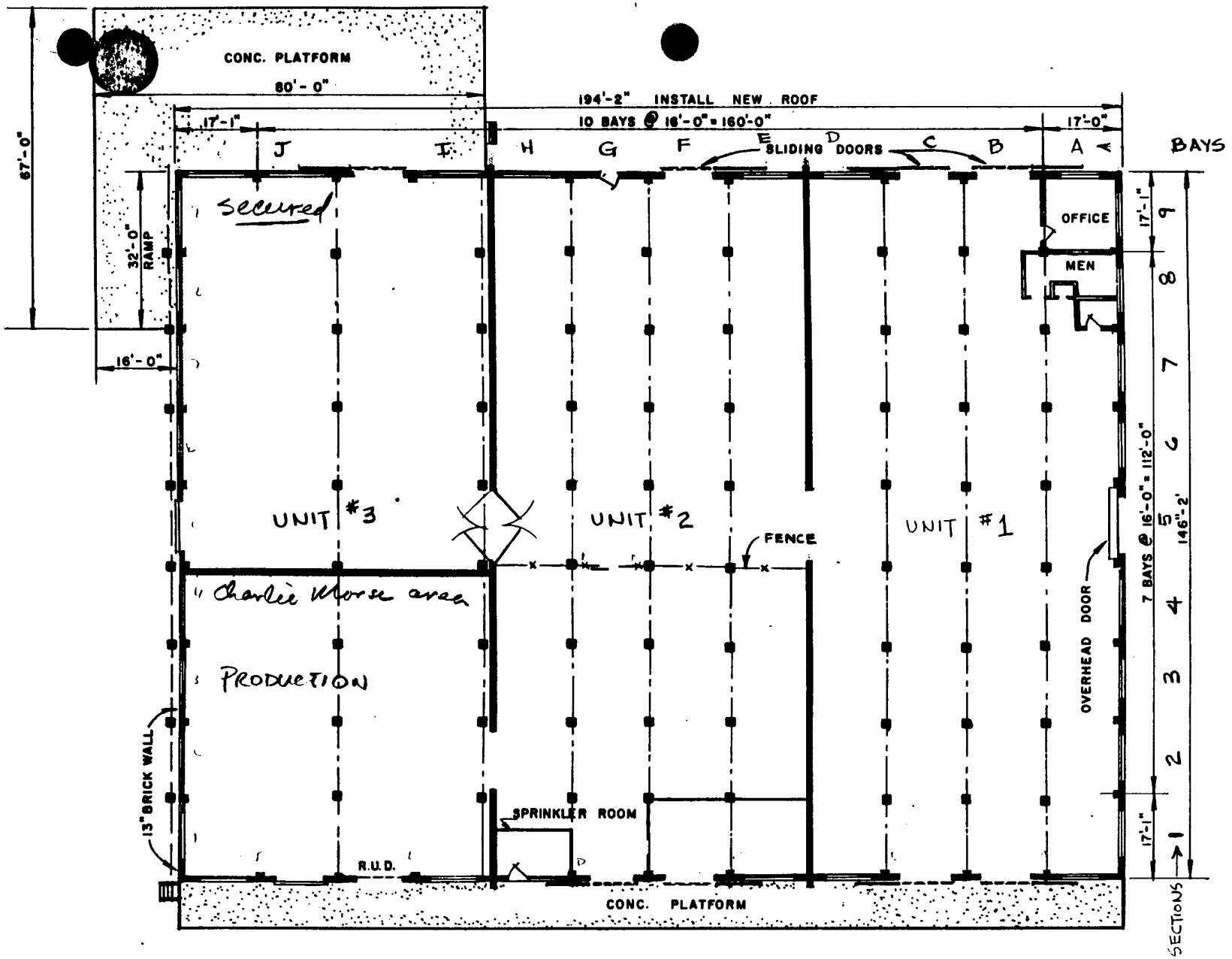
130-6

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
130 -	UNIT 2	2	F96T12	35	70	175	6,125	11	16,844	
WAREHOUSE	UNIT 3	2	F96T12	15	30	175	2,625	11	7,219	
	OFFICE	2	F96T12	4	8	175	700	11	1,925	
	COMPOSITE	2	F96T12	27	54	175	4,725	11	12,994	
				81	162		14,175		38,981	
	UNIT 2	2	F90T17	9	18	215	1,935	11	5,321	
	UNIT 1	2	F40T12	36	72	96	3,456	11	9,504	
	TOTALS			126	252		19,566		53,807	

SQ. FT. = 27,625
WATTS/SQ. FT. = 0.7



130-8

NET FLOOR AREA
27,625
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

MAIN FLOOR PLAN
WEST STOREHOUSE
BUILDING NO. 130

Scale: 1" = 30'-0" Date:

Revisions	Date

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: _____

IDENTITY:

OPERATION Boiler Plant

Address Bldg 136

Type(s) of occupancy _____

Name of person in charge of energy Rich Frank

PHYSICAL DATA:

Building orientation _____

No. of floors _____

Floor area, gross, square feet _____

Net air conditioned square feet _____

Construction type:

Walls (masonry, curtain, frame, etc.)

N _____ S _____ E _____ W _____

136 - 1

Figure 15-14. Building Information

1. **GENERAL INFORMATION**

Surveyed by: P. Hutchins

Survey Date: _____

IDENTITY:

OPERATION Warehouse and Property Disposal

Address Bldg 145

Type(s) of occupancy Small admin - htd / remainder is storage unheated and dehumidified

Name of person in charge of energy Theresa Nilo / Chuck Zimmerman

145-1

PHYSICAL DATA:

Building orientation Long dimension runs N/S

No. of floors 1

Floor area, gross, square feet 126,720

Net air conditioned square feet /

Construction type:

Walls (masonry, curtain, frame, etc.)

N / S / E / W /

Figure 15-14. Building Information

Roof:

Type: Flat ✓ **Color:** Light _____

Pitched _____ Dark _____

Glazing:

Exposure	*Type	%Glass/Exterior wall area
N		None
S		
E		
W		

*Type: Single, double, insulating, reflective, etc.

Glass shading employed outside (check one)

Fins _____ Overhead _____ None ✓ Other _____

Glass shading employed inside (check one):

Shades _____ Blinds _____ Drapes, open mesh _____ Drapes opaque _____ None ✓ Other _____

SKETCH OF BUILDING SHOWING PRINCIPLE DIMENSIONS:

BUILDING TYPE:

All electric _____

Gas total energy _____

Oil total energy Oil-fired boiler

Other _____

145-2

BUILDING OCCUPANCY AND USE:

Weekdays: Occupied by:* 4 people from 0730 to 1600 (hours) supply DRMS

5 " "

Saturdays:

Sundays, holidays

Hours air conditioned: Weekdays from____ to____; Saturdays____ to____ Sundays, holidays from____ to____

*(Account for 24 hours a day. If unoccupied, put in zero)

2. ENVIRONMENTAL CONDITIONS

OUTDOOR CONDITIONS

Winter: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

Summer: Day____ °F. dB____ mph wind Night____ °F. dB____ mph wind

MAINTAINED INDOOR CONDITIONS:

Winter: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

Summer: Day____ °F. dB____ %rh Night____ °F. dB____ %rh

78F TSTAT op's blr - needs to be set lower

76F Enclosure is heated SE unit htr - constantly running
couldn't find TSTAT
uninsulated in enclosed area and front room

Figure 15-14. Building Information (con't)

Source of heating energy:

Hot water_____ Steam ✓ 15psig Electric resistance_____ Other_____

Heating plant:

Boiler No. Weil McClain BHO-40-7 Rating 1.4 MBTU/hr MBH OUTPUT

12.4 gal/hr #2 oil

Boiler type:

Firetube_____ Watertube_____ Elec. resist._____ Electrode_____ Other_____

Fuel used #2 fuel Oil Standby_____

Hot water supply_____ °F, Return_____ °F

Steam pressure_____ psi

Pumps No._____ Total HP_____

Room heating units:

Type: Baseboard_____ Convectors ✓ Fin tube_____

Ceiling or wall panels_____ Unit heaters ✓ Other_____

Small admin area is heated at front of East side of building

~60'x60' Area is heated with unit heaters within the building

All else is unheated

Cooling plant: None

Chillers: No._____ Total capacity (tons)_____

Type: Centrifugal_____ Reciprocating_____ Absorption_____

Figure 15-14. Building Information (con't)

Condenser water used for heating_____

Demand limiters_____

Energy storage_____

Heat recovery wheels_____

Enthalpy control of supply-return-exhaust damper_____

Recuperators_____

Others_____

LIGHTING:

Interior lighting type:_____

Watts/ft^2: Hallway/corridor_____

Work stations_____

Circulation areas within work space_____

On-off from breaker panel_____ Wall switches_____

Control switching_____

Exterior Lighting: Type_____ Total KW_____

DOMESTIC HOT WATER HEATING:

Size 80 gal Rated input_____ Water Temp. 120 °F

Energy Source: Gas____, Oil____, Electric ✓, Other_____

Figure 15-14. Building Information (con't)

OPERATION WAREHOUSE LOCATION BLDG 145 DATE 10/16/91

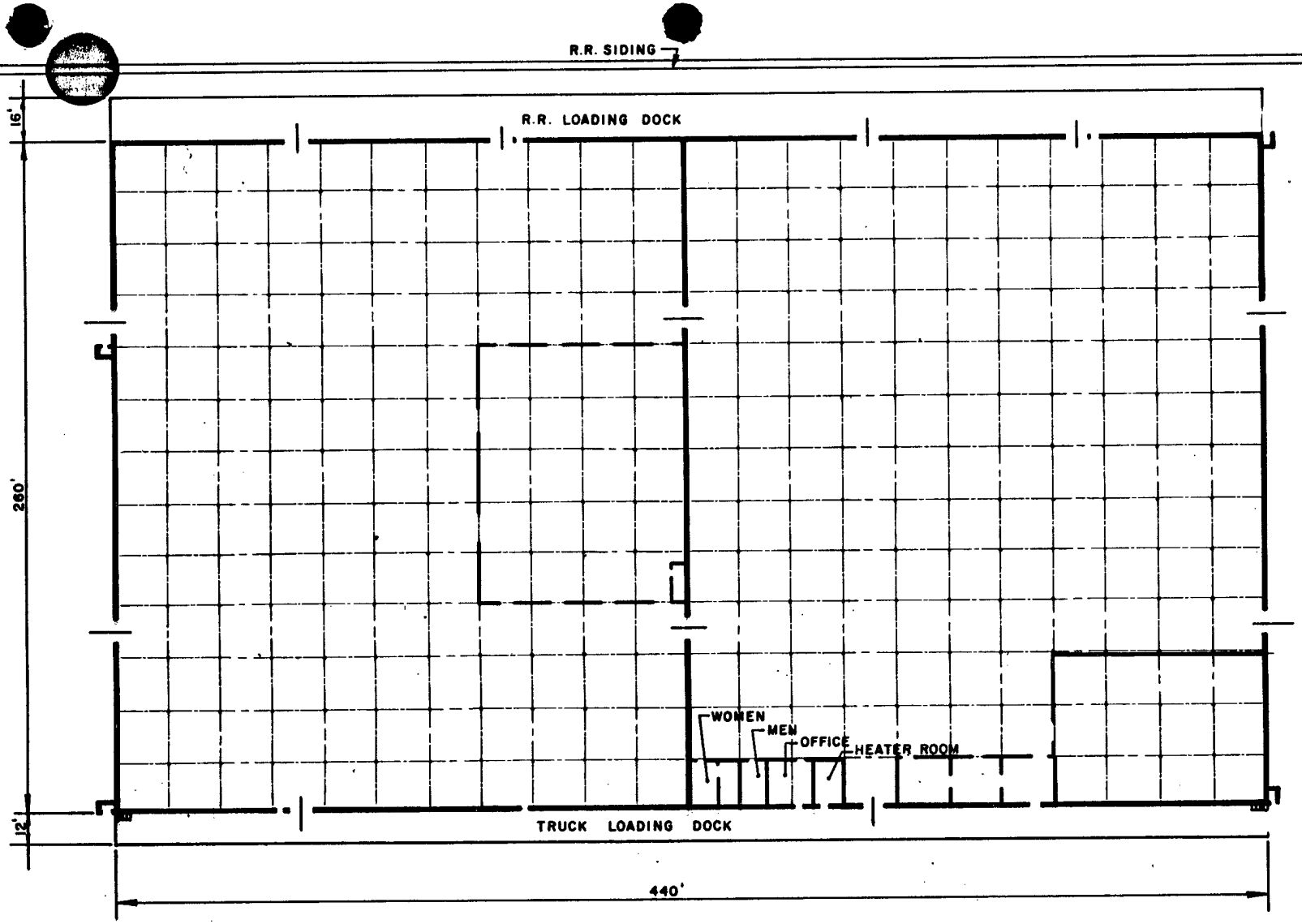
MFG'R.	LIGHT # FIXTURE	LOCATION	NO.	WATTS PER FIXTURE	LUMENS	Hrs. Operated Per Day	Days Operated Per Week	KWH Per Per Week	COMMENTS
F90 4'	2	Office	4						Breaker box (lights on)
"	"	"	2						
F96 8'	2		57	252					Warehouse } all
F96 8'	2		58	252					" } lights
F40 4'	2		38	92					on

Figure 15-16. Energy Survey - Lights

LIGHTING SURVEY
WATERVLIET ARSENAL
DATES: 15 OCT 91 - 18 OCT 91
PROJECT # 290-0379-002

BLDG #	LOCATN	LTS/FXTR	LAMP	# FXTR	# LTS	W/FXTR	WATTS	HRS/DA	KWH/YR	COMMENTS
145 - WAREHOUSE		2	F40T12	38	76	96	3,648	11	10,032	
		2	F90T17	6	12	215	1,290	11	3,548	
		2	F96T12	115	230	175	20,125	11	55,344	
	TOTALS			159	318		25,063		68,923	

SQ. FT. = 113,510
WATTS/SQ. FT. = 0.2



8-541

NET FLOOR AREA
113,510
Square feet

FLOOR CAPACITY
1000 LBS
Per square foot

N

WATERVLIET ARSENAL
WATERVLIET, N.Y.

Drawn by: J.R.GANGEMI, A.E. App'd by:

FLOOR PLAN
WAREHOUSE &
PROPERTY DISPOSAL
BUILDING NO. 145

Scale: 1"=60'-0" Date:

Revisions	Date